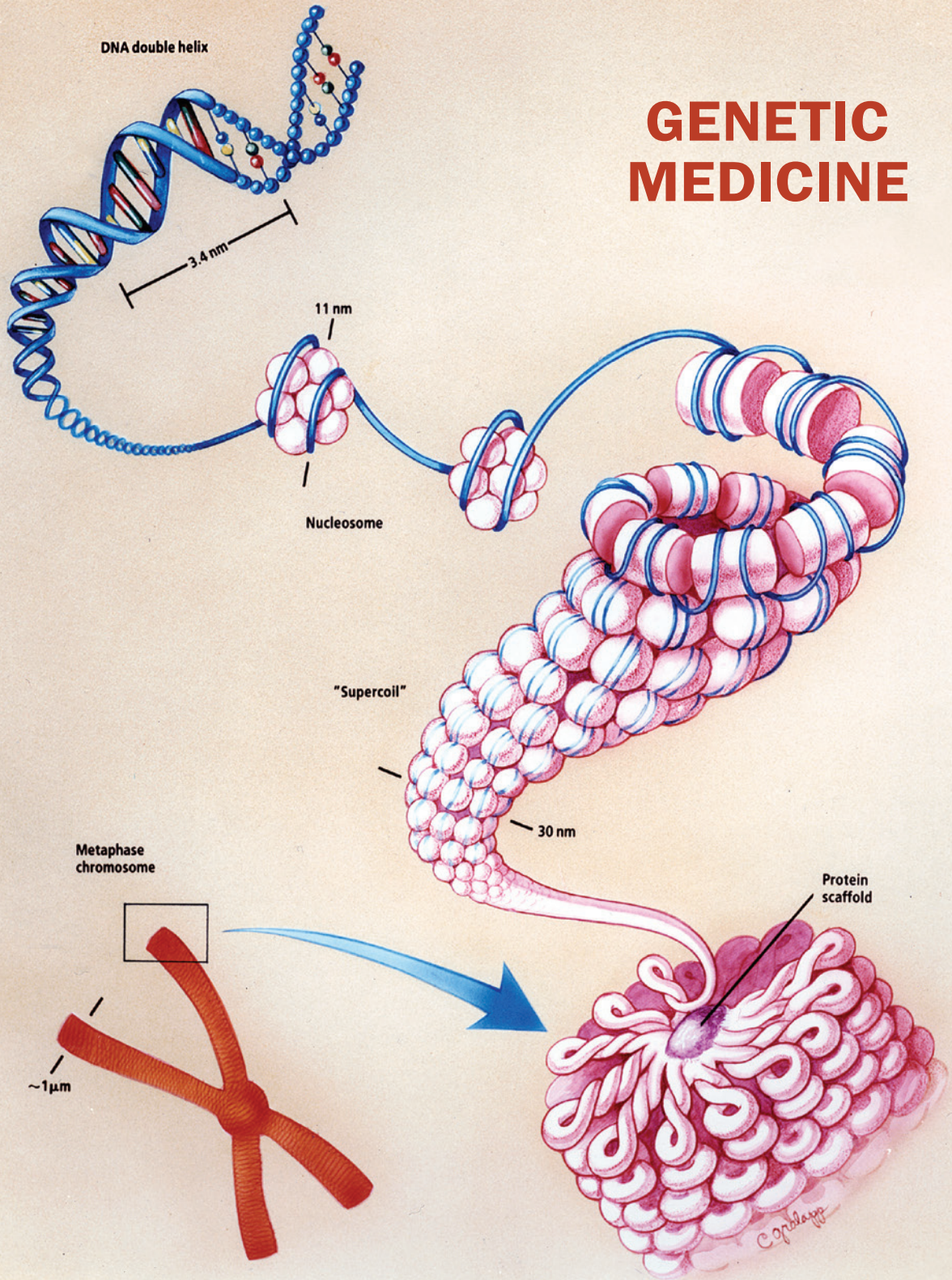
Volume 68, Number 2 Spring 2017 $6.95

Sonoma Medicine

GENETIC MEDICINE



SONOMA COUNTY MEDICAL ASSOCIATION
S·C·M·A

Leading Sonoma County into better health

Tirelessly defending the practice of

GOOD MEDICINE.

We're taking the mal out of malpractice insurance.
By constantly looking ahead, we help our members anticipate issues before they can become problems. And should frivolous claims ever threaten their good name, we fight to win—both in and out of the courtroom. It's a strategy made for your success that delivers malpractice insurance without the mal. See how at **thedoctors.com**

THE DOCTORS COMPANY
medical ~~mal~~practice insurance

Volume 68, Number 2 Spring 2017

Sonoma Medicine

The magazine of the Sonoma County Medical Association

FEATURE ARTICLES

Genetic Medicine

7 EDITORIAL
Double Helix . . . Double-Edged Sword?
"These are the powers, the promise, and in many cases, the perils that lie within genetic medicine."
Rachel Friedman, MD

9 TARGETED THERAPY
Genetic Approaches to Treating Cancer
"As physicians and researchers have become better at identifying the genetic underpinnings of cancer, they have created new ways to target those genetics."
Peter Brett, MD

13 23 AND YOU
Ethical Issues in DTC Genetic Testing
"Direct-to-consumer genetic testing, which allows consumers to access their own genetic information, has received significant media attention over the last few years and remains controversial."
Shilpa Shashidhara, PhD, Ruchika Mishra, PhD

17 PHARMACOGENOMICS
Genetic Screening for Drugs
"The way drugs act in our bodies is a function of multiple systems, almost all driven by our genetic makeup."
Allan Bernstein, MD

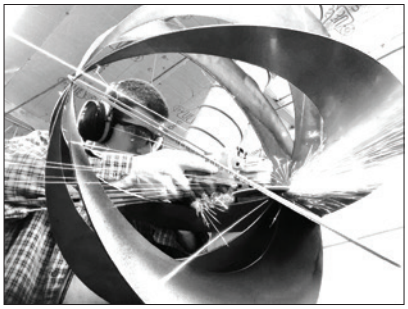
19 GENETICS AND INFERTILITY
Does Genetic Testing Help Infertile Patients?
"Many reproductive endocrinologists now find themselves treating more *fertile* women than *infertile* women. Infertility is no longer their specialty; reproduction is."
Jennifer Ratcliffe, MD, PhD

DEPARTMENTS

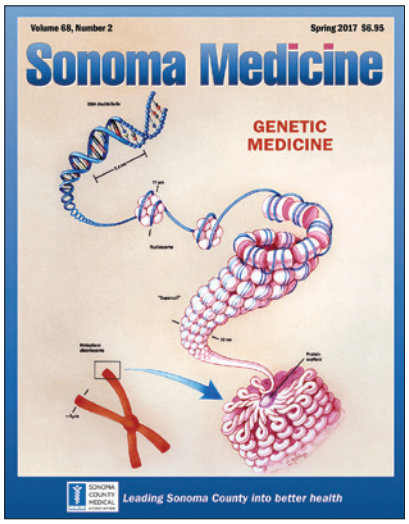
23 LOCAL FRONTIERS
Sonoma County Guidelines for Prescribing Opioids
"The guidelines standardize local opioid prescribing to known best practices and help ensure residents receive the highest quality of care and pain management while limiting unintended harm."
Karen Milman, MD, Lisa Ward, MD, Melissa Struzzo, MPH

Table of contents continues on page 2.

Page 26: Interview with Dr. Jason Cunningham



Page 40: Garden Tour artistry



Cover: Intervening levels of structural detail between DNA's double helix and the chromosomes.

Sonoma Medicine

DEPARTMENTS (cont.)

26 THE FUTURE OF PRIMARY CARE
A Conversation with Jason Cunningham, DO
"Our main principle is that all of health care is about relationship. In fact, relationship is our primary product."
Anastasia Coutinho, MD, MHS

29 MYSTERY CASE
A Traumatically Broken Contraceptive Implant
"A 25-year-old woman with two successful pregnancies was seen for a complaint of pain in her upper inner left arm, specifically the site of an etonogestrel-releasing implant placed one month prior."
Douglas Jimenez, MD

31 CURRENT BOOKS
Our Manual of Instructions
"In *The Gene,* Siddartha Mukherjee leads an unflinching inquiry into our lowest common denominator, weaving a story rich in culture and steeped in philosophical, moral and personal insights.
Stephen Meffert, MS, MD, Liana Meffert, BS

33 CURRENT BOOKS
Sugar's Toxic Toll
"In his most recent book, *The Case Against Sugar,* Taubes seeks to indict sugar, arguing that sugar may be the cause not only of diabetes, but also of the 'diseases of Western civilization.'"
Robert Schulman, MD

37 CHARITY CARE
Hey, Let's Give Back
"If all of our physicians and nurse practitioners could give an hour or two a month, just think of what we could accomplish by serving the poor and homeless with their medical needs."
Tom Honrath, MD

44 PRESIDENT'S REPORT
Change
"After a decade of affiliation with the Marin and Mendocino-Lake medical societies, SCMA is once again a stand-alone medical society."
Regina Sullivan, MD

39 New Members
39 Classifieds
39 Ad Index
40 SCMAAF News

Sonoma County Medical Association

Mission: To enhance the health of our patients and community; promote quality, ethical health care; and foster strong patient-physician relationships and the personal and professional well-being of physicians through leadership, partnership and advocacy.

Board of Directors

Regina Sullivan, MD
President
Peter Sybert, MD
President-Elect
Brad Drexler, MD
Treasurer
Patricia May, MD
Secretary
James Pyskaty, MD
Board Representative
Mary Maddux-González, MD
Immediate Past President

Danielle Franzini, MS
Margaret Gilford, MD
Len Klay, MD
Marshall Kubota, MD
Clinton Lane, MD
Karen Milman, MD
Rob Nied, MD
Richard Powers, MD
Rajesh Ranadive, MD
Jan Sonander, MD
Jeff Sugarman, MD

Staff

Wendy Young
Executive Director
Rachel Pandolfi
Executive Assistant
Susan Gumucio
Advertising Representative
Steve Osborn
Managing Editor
Linda McLaughlin
Graphic Designer

Membership

Active members 601
Retired 238

S · C · M · A
2312 Bethards Dr. #6
Santa Rosa, CA 95405
707-525-4375
Fax 707-525-4328
www.scma.org

WHEN YOUR SICK DAY FALLS ON A SATURDAY

AFTER HOURS CARE

We understand that life doesn't stop at 5 p.m., and neither do we. Our After Hours Care service is a community resource that treats most minor ailments and illnesses on a walk-in basis.

For more information, including our current hours of operation at each location, please visit: **StJosephHealthMedicalGroup.com/AfterHours**.

After Hours Care Locations:

Santa Rosa
510 Doyle Park Dr.
(707) 303-1712

Petaluma
905 E. Washington St.
(707) 790-8064

Monday through Friday 5 – 9 p.m.
Weekends and Holidays 9 a.m. – 2 p.m.

Sebastopol
652 Petaluma Ave., #B
(707) 823-7616

Windsor
8911 Lakewood Dr., #B
(707) 387-3910

Monday through Friday 3 – 7 p.m.

Walk-ins welcome.
No appointment necessary.

St. Joseph Health
Medical Group
Formerly known as Annadel Medical Group

Value of Membership

PRACTICE ◆ PROFESSIONAL ◆ PERSONAL

"Physicians get busy and don't realize how valuable it is to be united.

Being organized gives us the power to deliver high-quality health care and to practice medicine in an environment that's good for us *and* for our patients."

JAMES PYSKATY, MD
Pediatrics
SCMA Board Member
james.x.pyskaty@kp.org
393-3158

COMPLETE LIST of MEMBER BENEFITS page 38

Why **PHYSICIANS PRACTICING IN SONOMA COUNTY** *should be SCMA/CMA members:*

1. There are "10 million reasons to be a CMA member" because the medical association's **reimbursement experts have recouped $10 million from payors** on behalf of physician members over the past five years.
2. CMA **faces down a slew of legal challenges** to the practice of medicine throughout the year, with issues including scope of practice, Medicare audits, peer review and medical staff self-governance.
3. **Stay up to date on health care issues** affecting Sonoma County physicians with online and print media including *Sonoma Medicine* and *News Briefs*. CMA also produces several publications for members.

Join SCMA/CMA Now! ▪ 707-525-4375 ▪ scma@scma.org

Sonoma Medicine

Editorial Board

Jeff Sugarman, MD
Chair
Allan Bernstein, MD
Ana Coutinho, MD
Rachel Friedman, MD
Brien Seeley, MD
Regina Sullivan, MD
Kristen Yee, MD

Staff

Steve Osborn
Editor
Wendy Young
Publisher
Linda McLaughlin
Design/Production
Susan Gumucio
Advertising

Sonoma Medicine (ISSN 1534-5386) is the official quarterly magazine of the Sonoma County Medical Association, 2312 Bethards Dr. #6, Santa Rosa, CA 95405. Periodicals postage paid at Santa Rosa, CA, and additional mailing offices.

POSTMASTER: Send address changes to *Sonoma Medicine*, 2312 Bethards Dr. #6, Santa Rosa, CA 95405.

Opinions expressed by authors are their own, and not necessarily those of *Sonoma Medicine* or the medical association. The magazine reserves the right to edit or withhold advertisements. Publication of an ad does not represent endorsement by the medical association. Email: scma@scma.org.

The subscription rate is $27.80 per year (four quarterly issues). For advertising rates and information, contact Susan Gumucio at 707-525-0102 or susan@scma.org.

www.scma.org

Printed on recycled paper.

© 2017 Sonoma County Medical Association

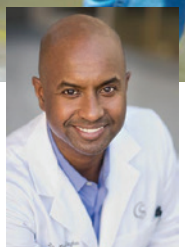
Breathe again!!

California Sinus Centers & Institute

We CARE for:

- Bacterial infections / Sinusitis
- Functional endoscopic sinus surgery
- Image-guided surgical navigation
- Revision — complex cases
- Frontal sinusitis
- Advanced endoscopic techniques
- Sinuplasty
- Sinus surgery WITHOUT packing
- Nasal obstruction / Septoplasty
- Allergic fungal sinusitis
- Culture-directed treatment
- Orbital decompression / Grave's disease
- Tear duct surgery — Watery eyes
- Sinonasal tumors / Polyps
- Smell / Taste problems
- Complications of prior surgeries
- CSF leak repairs
- Mucoceles / Abcesses
- In-office CT scanner
- Urgent appointments
- Joint care: ENT – Allergy – Pulmonary

Karen Fong, MD



Winston Vaughan, MD

Kathleen Low, NP

• Sonoma •
• Atherton (Stanford area)
• Walnut Creek (East Bay)
• Fresno • Pleasanton

www.CalSinus.com

Reduce Office Workload
Expand Patient Service
Retain Pleased Patients

Patients new to Medicare and Medicare Insurance will enjoy high quality enrollment assistance. "Informative Kits" include Medicare Enrollment Solutions, by Gary Smith.

FREE Service: **Gary resolves Medicare Patients' insurance claim issues** by working as long & resourcefully as needed with insurance companies, pharmacies & other health care providers.

FREE Service: many assisted people will prefer & appoint Gary as their Medicare Insurance broker.

Why Gary Smith:

1977 Graduated from U.C. Berkeley. **1982** Health Insurance licensed in Sonoma County.

1989 to 1993, the Sonoma County Medical Association endorsed Gary as one of two representatives for its physician's disability insurance program. **SCMA endorsed Gary because of his excellent service to many physicians' patients, employees, families and/or themselves.**

To request Informative Kits, call 707-576-8100

2016 TESTIMONIALS

My girlfriend asked, ***"Where did you find that guy?"*** She asked after I told her about Gary making many phone calls to resolve a communications problem between a pharmacy, my physician's office and two departments inside of the insurance company. ***Beverley Saul***

From his presentation of Medicare Advantage, to his assistance in arranging my upcoming surgery & organizing my appeal of Medicare part D penalties, **Gary was understanding, accessible and supportive**. ***Larry Coulter***

Gary provides fast responses with thorough answers. He clearly wants to help and he succeeds. ***Vidya Frazier***

Gary met with me at Social Security's office. **He helped with three Social Security employee meetings**. ***Lawrence Dilley***

1983, Gary first worked with my Medicare Insurance brokerage. In 30+ years, I have found Gary to be a person of his word. **Gary is a very fine person, a person of integrity**. ***Greg Macdonald***

Gary Smith, Owner/Broker
Bear Flag Insurance
CA Insurance License # 0631991
799 Piner Road #106,
Santa Rosa, CA 95403

Phone: 707-576-8100
Cell: 707-478-0210 call /text
Fax: 800-454-0369
Gary@SmithBrokerage.com
www.BearFlagIns.com

Double Helix . . . Double-Edged Sword?

Rachel Friedman, MD

July 8, 1997. I'm 17 years old. My heart is pounding as I sit outside in the parked car with my mom, tightly clutching today's mail. The results we've been waiting for have finally arrived. "Well, here goes," I say, and rip open the envelope. My eyes scan the page until I exclaim, "It says . . . greater than 99.9999% certainty . . . he's my dad!"

With a single direct-to-consumer DNA test, involving nothing more than a scrape of a few cells from inside our cheeks, my life—and the life of the father I would soon meet for the first time—would be forever changed.

The power to change lives, save lives, create lives. The power to know, to verify, to discover. The power to uncover hidden truths about the past and to predict—even create—the future. These are the powers, the promise, and in many cases, the perils that lie within genetic medicine.

As a science- and math-loving kid who had never met her father, I was smitten by Mendel and did my sixth-grade science fair project on genetics; I still have the display, a fading piece of poster board with colorful diagrams depicting straight and curly hair, attached and detached earlobes, tongue curling, and other dominant and recessive heritable traits.

But genetics involves far more than just hair color or earlobes: from its humble beginnings in the pea garden of that lone Franciscan monk in 1856, to the audacious sequencing of the entire human genome at the end of the 20th century, the past 150 years have seen a dizzying array of breakthroughs. This issue of *Sonoma Medicine* addresses just a few of them, bearing in mind the ethical, legal and moral ramifications if the breakthroughs are not adequately explored. As Jeff Goldblum quipped in *Jurassic Park*, "Yeah, but your scientists were so preoccupied with whether or not they *could*, they didn't stop to think if they *should*."

Dr. Friedman, a Santa Rosa family physician, serves on the SCMA Editorial Board.

A good starting point is Dr. Steve and Liana Meffert's compelling review of Siddhartha Mukherjee's *The Gene: An Intimate History*—a sweeping narrative that should be required reading as our genetic technology barrels ahead, even as we try assess where we are going.

In addition to paternity testing, which confirms what already exists, there are many other direct-to-consumer (DTC) options for testing what might be coming, such as cancer, obesity or dementia. Dr. Shilpa Shashidhara and Dr. Ruchika Mishra lay out the ethical issues for both consumers and their physicians with the rise of such DTC testing kits. They argue for both increased regulation and increased physician training in interpreting the results and implications of such testing.

Fifteen years after my first foray into DTC testing, I underwent a second test, this time with my husband, to find out if we were carriers for a number of heritable disorders. Fortunately we weren't; but what if the results had been different? What would we do with that knowledge? Cell-free DNA testing for women as early as 10 weeks gestational stage can identify the sex of the fetus with 99.7% accuracy. Is that good enough for a test that may lead parents to use the information for life-changing next steps? Preimplantation testing could enable parents to choose not just healthy embryos, but also those with the preferred sex or eye color. Dr. Jennifer Ratcliffe calls out what she sees as an ethical divide between reproductive endocrinologists who maintain a focus on infertility versus those who veer off into the enticing arena of designing babies.

Gene testing is particularly relevant to oncology. Dr. Peter Brett describes genetic approaches to cancer treatment, along with their often heartbreaking limitations. Yet, the future of personalized medicine is bright, given the advances in these genetic treatments and the types of gene-targeted prescribing described by Dr. Allan Bernstein in his article on pharmacogenomics.

For me, genetic testing has certainly led to more joy and happiness. Four days after receiving the positive paternity test back in 1997, I took a bus into New York City to meet my father for the first time. Turns out we look remarkably alike. We are both creative thinkers, musical, and prone to both procrastination and perfectionism. We are both eternally grateful for the 20-year relationship we have cultivated since then, and I feel more complete from knowing the person who gave me half my genetic makeup. And as I had suspected as a sixth grader, we both have curly hair and unattached earlobes. ◇

Author email: rachel.sc.friedman@kp.org

Our Doctor Loan could help you buy a home

If you're a medical professional who wants to buy a home, I'd like to help. The Bank of America® Doctor Loan is designed to meet your unique needs, and may make it easier to qualify for a mortgage.[1] For instance, we may not count student loans when we calculate your total debts.[2]

Other benefits include:

- You can put as little as 5% down on mortgages up to $1 million and 10% down on mortgages up to $1.5 million (some limitations apply)
- Start your new position up to 60 days after closing[3]
- Choose from a fixed- or adjustable-rate loan

The Doctor Loan could be a good choice for medical residents and licensed, practicing doctors, dentists or other eligible medical professionals. You can count on me to guide you though the process and help you find a home loan option that fits your needs.

Contact me to learn more.

Derrek Schurter
Sr. Wealth Management Lending Officer, VP
NMLS ID: 590682
707-529-2416 Cell
derrek.schurter@bankofamerica.com
mortgage.bankofamerica.com/derrekschurter

Bank of America

[1] An applicant must have, or open prior to closing, a checking or savings account with Bank of America. Applicants with an existing accont Merrill Edge®, Merrill Lynch® or U.S. Trust prior to application also satisfy this requirement. Medical professional (MD, DDS, DMD, OD, DPM, DO, residents, and students whose employment begins within 60 days of closing) must be actively practicing in their field of expertise. Those employed in research or as professors are not eligible. For qualified borrowers with excellent credit. PITIA (Principal, Interest, Taxes, Insurance, Assessments) reserves of 4-6 months are required, depending on loan amount. Other restrictions apply.

[2] Additional documentation is required.

[3] If applicant's employment does not commence until after closing, sufficient reserves to handle all debt obligations between closing and employment start date + 30 days must be verified.

Credit and collateral are subject to approval. Terms and conditions apply. This is not a commitment to lend. Programs, rates, terms and conditions are subject to change without notice. Bank of America, N.A., Member FDIC. Equal Housing Lender. ©2016 Bank of America Corporation. ARM5MFD3 HL-112-AD 05-2016

Genetic Approaches to Treating Cancer

Peter Brett, MD

At 16, JK didn't seem to be socializing well with his peers, wasn't doing well in school and had "attitude" problems with teachers and counselors. (JK and other patients discussed in this article are based on real patients, but their clinical and social histories have been changed to maintain confidentiality.) Lately JK hadn't been talking much with his mother, but he finally reported that there was a large black lump on the skin of his mid-back that was getting bigger, and starting to hurt and bleed. The lump had probably been growing for more than a year, but JK was never one to complain. Biopsy showed melanoma, so JK and his mother came to our office for treatment.

JK's prognosis was poor. The melanoma was ulcerated and deep, and surgical excision with sentinel lymph node biopsy showed that it had already spread to the axilla. JK absolutely did not want to have additional treatments to prevent recurrence, and his mother didn't push it. Realistically, additional treatment might have helped only a little. A few months after surgery, the melanoma spread to his liver, lungs and bones. JK started losing weight, was always tired and began having more pain.

Dr. Brett is a medical oncologist with Sutter Medical Group of the Redwoods in Santa Rosa.

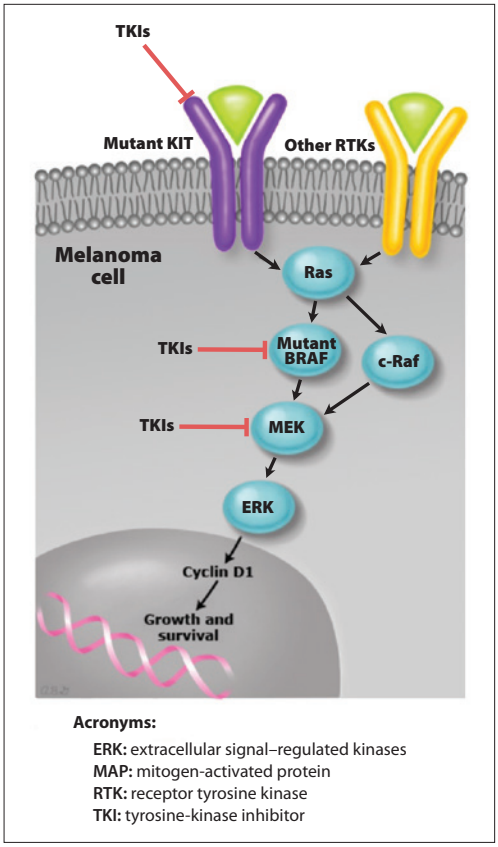


Figure 1. The MAP kinase pathway

JK and his mother decided he should get treatment now, but the prognosis was terrible. This was late 2010, and even young patients with metastatic melanoma could be expected to live only a few months. We gave JK chemotherapy with intravenous dacarbazine, which alkylates DNA guanine, causing double strand breaks, toxic to rapidly dividing cancer cells. JK lost his hair and felt a little nauseated, but he otherwise tolerated the treatment fairly well. The cancer seemed to stabilize for a few months, but then it began growing again, and he became much weaker, spending most of his time in bed.

Around this time, we heard about a new drug in clinical trials, vemurafenib, that targeted BRAF genetic mutations, and when we tested JK's archived melanoma biopsy, it did test positive for a BRAF mutation. Vemurafenib seemed to have promise, but we were unable to find a nearby clinical trial that would allow enrollment of a patient under age 18. We wrote to the FDA, and they finally approved our use of vemurafenib on a compassionate-use basis for JK. The drug was sent overnight to JK's house in July 2011—but JK had died the previous night.

In August 2011, the FDA approved vemurafenib for use in metastatic melanoma. In about half the patients with melanoma, the mitogen-activated protein kinase pathway is overactive because of a V600 mutation in the BRAF gene. This overactivity leads to rapid proliferation and extended survival of melanoma cells (Figure 1).

By the time another patient, ML,

came to see us, in September 2011, we finally had this more precise weapon on hand to help patients with melanoma. ML was in her early 30s, with a supportive husband and two children who were "a handful." Melanoma had spread to her lungs a few months earlier, and she'd received both dacarbazine and another chemotherapy drug, paclitaxel, from another practice. Although ML exhibited few symptoms of the cancer, the lung lesions continued to grow, and the writing was on the wall: soon she'd start experiencing dyspnea and cough, and symptoms would worsen from there.

We tested ML's original melanoma's BRAF gene, and just like JK's, her tumor had the same V600 mutation, so we started treating her with vemurafenib. Within three weeks, a CT scan of her chest showed that the lung metastases had nearly completely resolved, a response that seemed almost miraculous.

A common myth is that oral medications targeting an abnormal protein in a cellular pathway caused by a genetic mutation will be a "piece of cake" to tolerate. Since the genetic mutation is specific to the cancer cell, why would we expect serious side effects? Unfortunately, proteins in normal cells are also often inhibited, and many targeted treatments are in fact "promiscuous": they can block the function of other proteins beyond the targeted mutation. Targeted treatments can also stimulate cellular feedback loops that turn on dangerous parts of a cellular pathway. In other words, targeting one gene mutation in a cancer cell can lead to "innocent bystander" side effects that might not be predicted.

While ML's melanoma did respond quickly to vemurafenib, she also experienced many serious side effects. She developed moderate fatigue, and she needed help to care for her children. She had severe photosensitivity, and her skin became very dry, with small crusty white papules. Her muscles and joints often ached, and she needed to take round-the-clock pain medicine to cope. Paradoxically, she developed several squamous cell skin cancers, a known side effect of vemurafenib from the stimulation of other cellular feedback loops, and these skin cancers had to be excised.

TKI	Response rate	Progression-free survival
imatinib/CML-BCR/ABL fusion	>90%	often indefinite
erlotinib/lung-EGFR mutated	80%	9-13 months
osimertinib/lung-EGFR T790M mutated	70%	10 months
crizotinib/lung-ALK fusion	70%	10 months
vemurafenib/melanoma-BRAF mutated	50%	7 months
ceritinib/lung-ALK fusion	40%	5 months
olaparib/ovarian-BRCA mutated	30%	8 months

Figure 2. Selected TKIs

Despite the side effects, ML and her family didn't want to give up on vemurafenib. But the treatment became ineffective after about a year. In late 2012, her melanoma roared back, spreading in her lungs and to her liver. We tried additional treatment, but nothing helped, and she died about three months after the vemurafenib stopped working.

Vemurafenib is one of dozens of new oral tyrosine kinase inhibitors (TKIs) that comprise part of the contemporary gene therapy arsenal for cancer treatment (Figure 2). Rapid improvement in gene sequencing technology has helped identify "driver mutations" among the many genes mutated in cancer cells. These genes encode abnormal proteins that drive the cancer's growth and proliferation. TKIs are often effective, and they work quickly. In several of our patients, we've observed the so-called "Lazarus effect," where bed-bound patients in severe pain are ambulating and free of pain within 3–5 days of starting the TKI, essentially rising from the dead.

Encouraged by these dramatic results, many oncologists now routinely search for other mutations in their patients' cancers in the hope of finding a driver mutation whose inhibition could shrink the patient's cancer. For example, a patient with metastatic pancreatic cancer progressing after treatment with chemotherapy has no standard treatment options available, and no driver mutations have been found in most patients with pancreatic cancer, so there are no FDA-approved targeted gene therapies. But now oncologists can order next-generation sequencing of the patient's tumor, which will sometimes identify mutations in genes that might be drivers of the cancer's growth. A patient's pancreatic cancer might also have a BRAF mutation, like melanoma, for example, and oncologists could then consider vemurafenib as a treatment.

Alas, the track record is poor for seeking driver mutations of an individual cancer and then targeting the mutation with a drug normally used in a different cancer type. The strategy turns out to be effective only about 10% of the time,[1] and the actual and mental cost of this strategy—the expense, the inevitable delay waiting for results, the disappointment—is high.

As physicians and researchers have become better at identifying the genetic underpinnings of cancer, they have created new ways to target those genetics. Antibodies like trastuzumab, for example, can be used to target HER2 receptors in breast cancer (Figure 3). Oncogenes amplified in some breast

cancers cause the HER2 protein to be overexpressed on the surface of the cells, driving the growth of these tumors.

A new form of genetic therapy actually takes the reverse approach. Instead of targeting a genetic change in a cancer, how about creating a genetic change in a virus, thus making it more lethal to cancer cells, and then injecting it into a tumor to kill it? This is the mechanism behind a newly approved (and nearly unpronounceable) treatment for melanoma: talimogene laherparepvec. In the treatment, an attenuated herpes simplex 1 virus is genetically modified to encode granulocyte-macrophage colony stimulating factor, which lyses tumor cells and recruits antigen-presenting immune cells to destroy the melanoma. Viral treatment is still in its infancy, with significant potential.

Yet another form of "reverse engineering" genes is the development of chimeric antigen receptor T-cells. A patient's own T-cells are modified by a viral vector to express a receptor specific for an antigen on leukemia cells. In small studies, dramatic remissions can be seen for a time, albeit with substantial toxicity from the treatment.[2] This treatment is still only available in clinical trials.

Genetic treatments for cancer are often effective, and they've revolutionized the approach to cancer treatment in the last few years. Yet they have an Achilles' heel: few of them work forever or actually cure the cancer (Figure 2). One exception is imatinib for chronic myeloid leukemia (CML). Imatinib targets the translocation of BCR to ABL in chromosomes 9 and 22, the driver mutation of CML. More than 90% of patients whose CML responds to imatinib treatment after a year continue to respond for many years.[3]

The more common outcome for patients who receive targeted therapy for genetic mutations is the same as for patient ML: the treatment works for several months to a year or two, but then it becomes ineffective. Often the cancer cells develop other mutations that circumvent the targeted inhibition. A new strategy to overcome this resistance is to combine targeted genetic treatments. For example, combining a BRAF inhibitor and a MEK inhibitor for melanoma (Figure 1) will delay the time until a melanoma becomes resistant to treatment. But this effect remains modest and usually temporary.

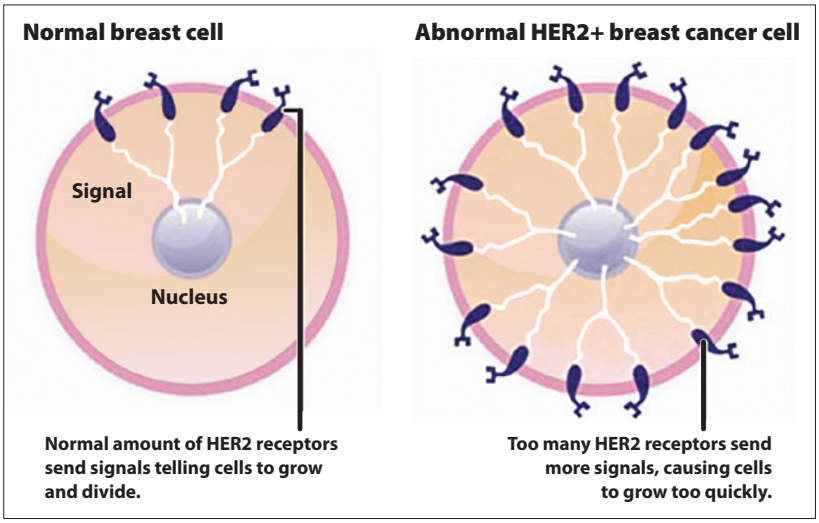

Normal breast cell
Abnormal HER2+ breast cancer cell
Signal
Nucleus
Normal amount of HER2 receptors send signals telling cells to grow and divide.
Too many HER2 receptors send more signals, causing cells to grow too quickly.

Figure 3. HER2 receptors

Of all the genetic therapies for cancer, the most promising isn't usually thought of as genetic therapy at all—but it clearly is. Our patient RV is an 81-year-old woman with COPD and heart disease. A life-long smoker, she has never been able to quit despite many attempts. RV presented with worsening cough and dyspnea in the fall of 2015 and was found to have metastatic squamous cell lung carcinoma with spread from the right lung to the mediastinum and left lung. Genetic testing showed no driver mutations, but her tumor cells expressed the programmed-death ligand 1 (PD-L1) to a high degree (Figure 4). Also, probably because she'd been a heavy smoker, the cancer's tumor mutation burden (TMB) was very high. In genetic speak, this means that the cancer had so many mutations that RV's own immune system T-cells should have been able to recognize the cancer as foreign and eliminate it; but the cancer cells were smart enough to put a wall of PD-L1 around themselves, inactivating any surrounding T-cells.

RV was much too frail to tolerate traditional chemotherapy, so we tried treatment with what might be the ultimate gene therapy: immunotherapy. Immunotherapy (in this case the PD-1 antibody pembrolizumab) unblocks the tumor inactivation of the T-cells, unleashing the T-cells to go on the attack against the antigenic proteins encoded by the many cancer cell mutations (Figure 5). Often the higher the TMB, the better the chance the T-cells have of recognizing and destroying the cancer cells. RV's cancer quickly shrank on pembrolizumab, and she's been free of cancer progression now for over a year. She's also had no side effects at all except mild itching.

Immunotherapy allows the patient's own T-cells to do the dirty work of recognizing gene mutations through the abnormal encoded cancer cell antigens. Unlike the temporary responses of using targeted treatments against specific mutations, immunotherapy can produce long-term responses because the immune system "learns" how to attack the cancer and doesn't seem to forget. Not all responses are long-lasting, however, and the response varies by tumor type. Unlike targeted treatments, immunotherapy with PD-1 or PD-L1 antibodies rarely causes serious side effects. Only about 10–15% of patients get serious reactions to treatment, usually autoimmune side effects that themselves can be treated with corticosteroids, if necessary.[4]

Why did the cancers in patients JK, ML and RV run amok through their bodies? At the fundamental level, the genome of these cancer cells differed

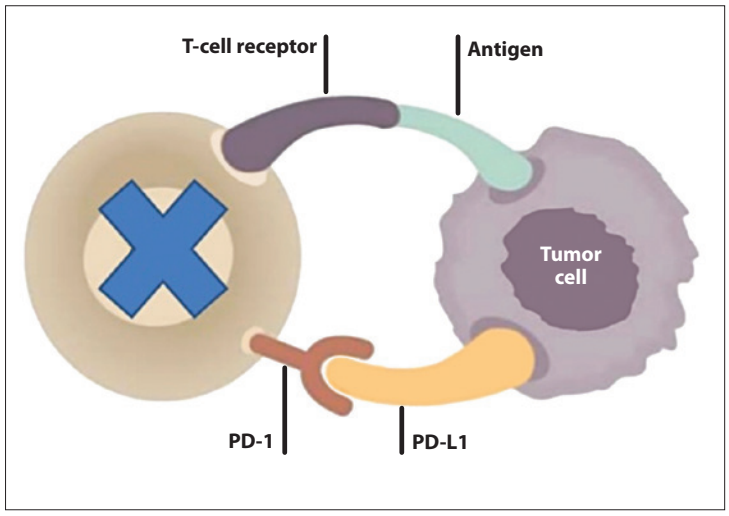


Figure 4. PD-1/PD-L1 interaction inactivates T-cells

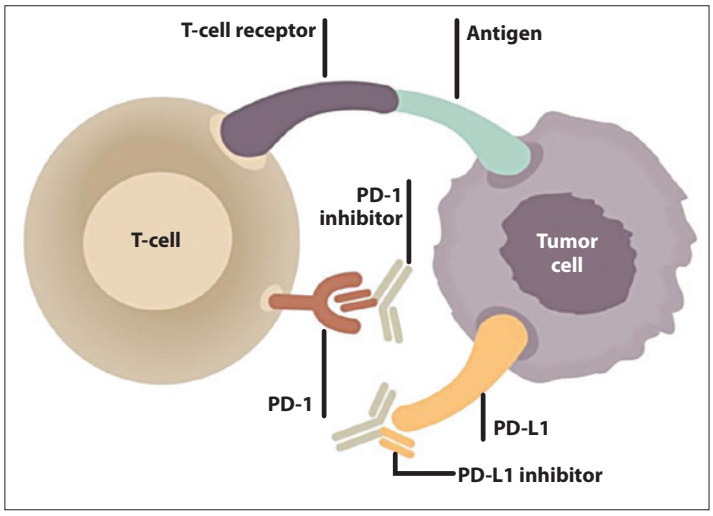


Figure 5. PD-1/PD-L1 inhibitors activate T-cells

from their normal cells, leading to abnormal cellular behavior. As we continue to learn more about the complexity of these differences, we should be able to target them with improved drugs or train patients' immune systems to do so. The future of cancer genetic treatment looks bright. ◇

Author email: brettp@sutterhealth.org
Letters to editor: osborn53@sonic.net

References

1. Meric-Bernstam F, et al, "Feasibility of large-scale genomic testing to facilitate enrollment onto genomically matched clinical trials," *J Clin Oncol*, 33:2753 (2015).
2. Maude SL, et al, "Chimeric antigen receptor T-cells for sustained remissions in leukemia," *NEJM*, 371:1507 (2014).
3. Andreas H, et al, "Long-term outcomes of imatinib treatment for chronic myeloid leukemia," *NEJM*, 376:917 (2017).
4. Ribas A, et al, "Association of pembrolizumab with tumor response and survival among patients with advanced melanoma," *JAMA*, 315:1600 (2016).

Sutter Medical Group of the Redwoods
AFFILIATED WITH SUTTER PACIFIC MEDICAL FOUNDATION

A physician-owned, multi-specialty practice serving Sonoma County

JOB OPPORTUNITY FOR FAMILY MEDICINE AND INTERNAL MEDICINE PHYSICIANS

• 1–2 years guaranteed income • Relocation allowance • Sign-on bonus
• Generous compensation and benefits

Please send CV to Isabelle von Tobel: vontobi@sutterhealth.org | www.sutterhealth.org
Locums opportunities available

Ethical Issues in DTC Genetic Testing

Shilpa Shashidhara, PhD, Ruchika Mishra, PhD

Sarah was in her mid-30s when she found out she had elevated glucose levels after her annual physical examination. She was concerned about developing type 2 diabetes and remembered seeing an advertisement on social media about a home genetic testing kit that cost only $99. When Sarah received the test results in a few weeks, the report stated that she didn't have a genetic predisposition to diabetes. The bad news, according to the test, was that she had the gene associated with Alzheimer's disease. Confused and anxious, she wondered when the disease would affect her, if her other siblings and her parents were at risk, and if she should disclose this information to someone, along with several other questions and concerns. While Sarah is not a real patient whose care we were involved in, this is a typical patient scenario.

Direct-to-consumer (DTC) genetic testing, which allows consumers to access their own genetic information, has received significant media attention over the last few years and remains controversial. DTC genetic testing companies market their kits and services directly to consumers through the internet and other media outlets without requiring any visits to a clinic. The tests typically involve collecting a DNA sample at home (such as swabbing the inside of the cheek or providing a sample of hair) and mailing the sample back to a lab. Results are returned within several weeks to months.

Pandora's box. *Illustration by F.S. Church.*

Consumers seek DTC genetic testing for several reasons, ranging from disease risk to simple curiosity. A 2017 study found that prior to testing, consumers were most interested in ancestry (74%), trait information (72%) and disease risks (72%).[1]

DTC companies provide testing for a wide range of conditions, including cystic fibrosis, hereditary ovarian and breast cancer, and depression.[2] They also provide testing for non-health related genetic issues, such as determining ancestry, paternity and ethnicity.[3] Because DTC genetic tests are less costly than the traditional genetic testing method, they can be an attractive option for consumers.[3,4]

While DTC genetic testing may be an affordable and easily available option, it presents several ethical issues for the average consumer like Sarah. What did Sarah understand when she sent her sample in for testing? What was the purpose of the testing, and what would the results mean for her health?

Traditional genetic testing involves a thorough process of informed consent. A trained health care professional discusses the benefits and risks of testing; reviews the patient's medical history; explores psychosocial and family issues; and interprets the test results when they become available. In contrast, DTC genetic testing may not allow for informed consent, thus creating a gap between the consumer's understanding of testing and the meaning of test results. Consumers may also be influenced to test because of ads on social media, discounted offers, marketing gimmicks or other factors. Hence, while DTC genetic testing may seem to promote the patient's autonomy in gaining access to their genetic information, consumers may not be aware of the true risks and benefits.

Obtaining true informed consent to genetic testing is often challenging because of the complexity of interpreting test results. What does a positive test result mean, and how should people like Sarah understand their negative rest results? Traditional genetic tests are interpreted by a trained professional who takes multiple factors into consideration, including the patient's medical history, the family history, and the type of genetic test that was performed.

Dr. Shashidhara and Dr. Mishra are clinical bioethicists who provide ethics services at Sutter Health facilities in Sonoma County.

A significant issue with DTC genetic testing is that results are not always accurate or straightforward. The analytical and clinical validity and the clinical utility of DTC test results have been called into question. In 2013, the FDA banned a DTC genetic testing company, 23andme, from selling personal genetic testing kits after failing to provide information to back its marketing claims.[5] The FDA was concerned about the public health consequences of inaccurate results, and it feared that patients relying on such tests may begin to self-manage or even abandon their treatment plans. Since DTC genetic testing consumers typically do not have a genetic counselor or medical professional who interprets their test results, these patients may be prone to misinterpreting results and pursuing unnecessary medical options on the basis of ill-informed decisions regarding their health.

Some patients believe, based on DTC genetic testing, that they are at high risk for certain hereditary conditions that may affect other family members. These patients may not have acquired guidance from a counselor about how to disclose this information and with whom, nor on what impact this information may have on the physical and emotional health of family members. There are also concerns regarding the privacy and confidentiality of the genetic information about patients that is collected by DTC testing companies.

While some observers worry about the emotional consequences of test results on patients, studies have indicated few adverse psychological impacts or unwarranted behavioral changes from DTC testing.[6–8] The 2017 study mentioned above found that many consumers (38%) did not consider the possibility of unwanted information before pursuing DTC genetic testing.[1] About 2% of respondents reported regret about seeking genetic testing, and 1% reported harm from receiving results.[1] While most respondents perceived DTC genetic testing to be useful in determining future health decisions, many respondents did not appear to consider the potential risks of DTC testing before beginning the process.

DTC genetic testing also presents ethical challenges for health care providers. Oftentimes, patients who have used DTC genetic testing want to discuss their results with their personal physician to obtain a more detailed interpretation and better understanding of the results. Ethical dilemmas can arise for physicians and genetic counselors who are asked to interpret these results.

The federal Clinical Laboratory Improvement Amendments (CLIA) ensure the analytical validity of genetic tests. Some DTC genetic tests aren't certified by CLIA, so there is uncertainty about the quality and validity of those tests. Thus, a physician or genetic counselor may have limited ability to respond to patient requests for interpreting test results. Some studies have reported that primary care physicians who interpreted DTC genetic test results were frustrated by their delayed involvement and because their patients had been tested without prior counseling and didn't understand the implications of revealing their genetic information.[9,10] These studies also reported that physicians had little knowledge and awareness of triggers for appropriate referrals for genetic counseling and testing. Physicians who were aware of their lack of knowledge expressed concern and anxiety, and they did not feel qualified to discuss genetics or test results with their patients. Physicians also felt challenged about how to support patients who had received DTC testing.

Nineteen percent of physician respondents reported having patients who ask questions about DTC genetic testing or bring in their test results.[9] Of these physicians, 85% believed they were unprepared to answer their patients' questions, and 74% wanted to learn more about genetic testing to support their patients. There was also uncertainty regarding the responsible party for providing support to patients who were distressed or unsatisfied by their test results or interpretations. The physicians were unsure about their comfort with DTC genetic testing, and they expressed concern that maintaining a trusting relationship with these patients would ultimately require their involvement.[9]

These challenges raise several concerns for physicians with patients who pursue DTC genetic screening. Physicians may be put in a position where patients expect them to interpret genetic test results, and they may also be expected to interpret results in the context of the marketing claims made by the DTC genetic testing company. These situations may have negative consequences for the physician–patient relationship if the physician is unable to meet the expectations of the patient. Physicians may feel pressured to order further tests on the basis of the patient's DTC test results, even though there are no clinical indications for genetic testing.

Knowing when and how to access the expertise of a certified genetic counselor may be important for physicians. The studies described above suggest a gap in primary care physicians' knowledge of genetics, and they may need additional education and training.

As the field of genetic science advances, the opportunities for personalized medicine will also expand. These opportunities need to be presented within a regulated framework that helps patients make informed decisions about genetic testing. In addition, primary care physicians should receive training in how to counsel their patients regarding indications for testing and interpretation of complex test results. While DTC genetic testing companies target the patient as the key stakeholder, the implications of this process go beyond the patient, impacting physicians, the health care system, and the community. ◇

Author emails: ShashiS@sutterhealth.org, MishraRM@sutterhealth.org
Letters to editor: osborn53@sonic.net

The authors thank Ana Tyler, JD, MA, for her comments on the manuscript.

References appear on page 21.

Do you know What, When and How to Report Child Abuse?

FREE ONLINE COURSE!

- Course developed by the Child Abuse Prevention Center
- Approved for 1.25 *AMA PRA Category 1 Credits*™
- Approved for 1.25 CE credits
- ALL healthcare providers (MD, DO, RN, PhD, LCSW, MSW) are encouraged to take this valuable course!
- **Course available 24/7**
- *Course can be offered in a group training using a single log-in. Contact Leslie Iacopi at (415) 882-5167 for more details.*

Institute *for* Medical Quality

Register NOW at:

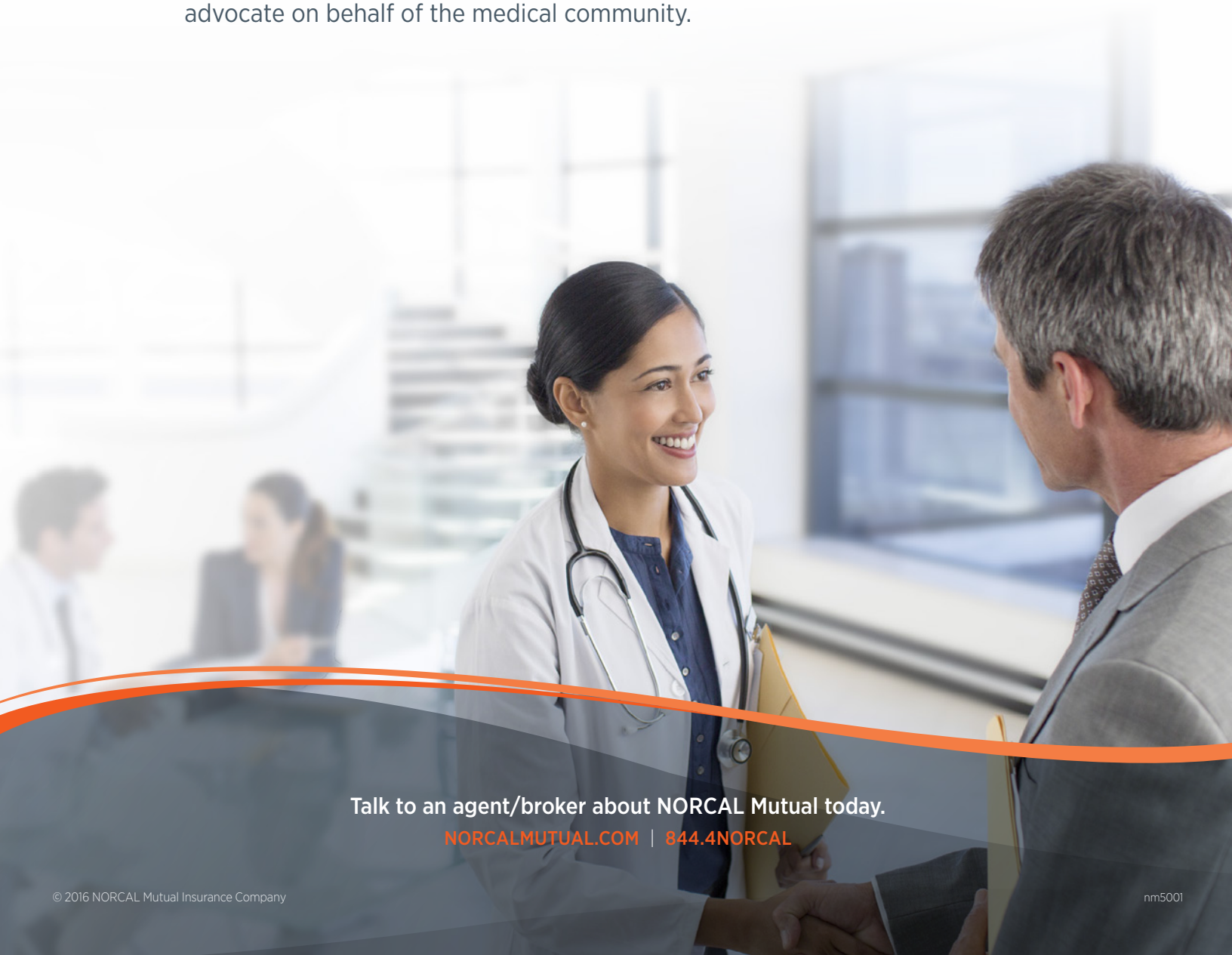
http://www.imq.org/education/caprrc.aspx

NORCAL MUTUAL®

MEDICAL PROFESSIONAL LIABILITY INSURANCE

PHYSICIANS DESERVE

Offering top-tier educational resources essential to reducing risk, providing versatile coverage solutions to safeguard your practice and serving as a staunch advocate on behalf of the medical community.



Talk to an agent/broker about NORCAL Mutual today.

NORCALMUTUAL.COM | 844.4NORCAL

© 2016 NORCAL Mutual Insurance Company

Genetic Screening for Drugs

Allan Bernstein, MD

Pharmacogenomics is the study of how our genome affects our response to drugs. The term is often used interchangeably with *pharmacogenetics*. Another term, *pharmacokinetics*, refers to how we study plasma concentrations of drugs, while *pharmacodynamics* describes how drugs bind to receptors, helping define therapeutic efficacy.

The way drugs act in our bodies is a function of multiple systems, almost all driven by our genetic makeup. The absorption and distribution of drugs, along with the site and duration of action and excretion, is genetically driven. In any individual, thousands of enzyme systems operate simultaneously to deal with drugs and other foreign materials.

As far back as Pythagoras, observers noted that some people in southern Europe got ill from eating fava beans, while northern Europeans did not. In 1940, a British scientist identified the G6PD enzyme as the culprit. People lacking the enzyme develop hemolytic anemia from fava beans. The enzyme is rarely absent in northern Europeans but often lacking in their southern neighbors. The drug dapsone similarly causes hemolytic anemia in people who lack G6PD activity. Other examples of the influence of genetics on drug tolerance include people who do not metabolize alcohol or lactose without producing unpleasant side effects.

Dr. Bernstein, a Sebastopol neurologist, serves on the SCMA Editorial Board.

Pharmacogenomic studies focus on the cytochrome P450 enzymes. This genetically driven system, with hundreds of variants, is involved in how up to 70% of drugs work in our bodies.

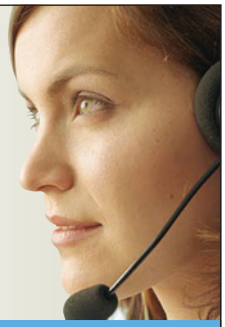
Drugs are modified by enzymes as they enter our bodies. They need to be modified to a soluble form that can be transferred to the site of action, where they are further modified to an active form. The modification itself may make the drug more or less physiologically active. Codeine, for example, is considered a pro-drug that is only active as its metabolite, morphine. A fast-acting cytochrome P450 (CYP) system may cause an overdose effect from a "normal" dose of codeine because the system converts the codeine to morphine so rapidly. Conversely, a slow-acting CYP system may fail to convert most of the codeine to its active form, making the drug essentially ineffective.

The tricyclic antidepressant amitriptyline uses the same CYP system as codeine. Amitriptyline, however, is only effective in its unconverted form. Rapid metabolizers have minimal to no effect from the drug once it is converted. When physicians prescribe codeine and amitriptyline to the same person, they assume an "average" rate of conversion so that both drugs are effective. High or low metabolizers will have unpredictable therapeutic responses.

Other drugs that have been well studied for genetic interaction include warfarin, clopidogrel, aspirin and anticonvulsants. The effectiveness of warfarin, for example, is affected by the Vitamin K epoxide reductase complex (VKORC) enzyme. Depending on the activity of the enzyme, the dose of warfarin needed to maintain a stable anticoagulation effect may vary by a factor of three. Other examples of genetic interaction include the toxic dermatologic side effects of both phenytoin and carbamazepine. These effects can be predicted with genetic markers, allowing physicians to adjust doses or suggest different classes of medications not dependent on the CYP system.

Genetic markers for drug metabolism are critical in managing cancer treatments, but they are rarely used in other therapeutic areas. One exception is screening for APOE (apolipoprotein E) status. APOE is an important regulator of cholesterol, fatty acid and glucose homeostasis, and it is synthesized by cells in the liver and by the astrocytes in the central nervous system. Different APOE alleles have been shown to correspond to risk for both cardiovascular disease and late-onset Alzheimer's disease. APOE2 homozygotes have very low risk, probably due to their rapid metabolism of both fatty acids and beta amyloid in the central nervous system. In contrast, APOE4 homozygotes, which are slow metabolizers of fatty acids and beta amyloid, are associated with up to 30 times the risk of Alzheimer's disease. Heterozygous patients (e.g., with APOE2/3 or APOE3/4) have intermediate risk levels. Potential subjects in Alzheimer's trials are screened for APOE status because the APOE4 cohort

Submit accounts online and
start collecting
lost revenue
right now!



Preferred group rate for current SCMA members

HIPAA-compliant debt recovery for delinquent patient accounts

AVAILABLE SERVICES
- Credit reporting
- Legal collection
- Training and consulting
- Client web portal

For more than 50 years, CCCS has collected for and professionally represented the Sonoma County medical community. Contact us to learn how your patients will be treated with respect* and why accounts are likely to be paid sooner.

*CCCS consistently works with and educates patients regarding payment obligations.

www.cccs1.com
1142 State Farm Dr., Santa Rosa, CA 95403

707-542-6495
TOLL-FREE: 800-655-6495

CAL COAST
BONDED & INSURED
CREDIT SERVICE

Provider
Job Opportunities

St. Joseph Health Medical Group, a premier multi-specialty practice based throughout Sonoma County, has openings for the following specialties:

- Family Practice
- Internal Medicine
- OB/GYN
- Hospitalist (FP or IM)
- Emergency Medicine
- Pulmonary/Critical Care

As a proud member of St. Joseph Health, St. Joseph Health Medical Group is fully integrated with Santa Rosa Memorial Hospital — a Level II Trauma Center and Petaluma Valley Hospital.

Generous salary, retirement and attractive benefits are available! Interested parties should send CV to **Ellen.Layher@stjoe.org**

StJosephHealthMedicalGroup.com

St.JosephHealth
Medical Group
Annadel Medical Group is now
St. Joseph Health Medical Group

is prone to complications from amyloid reducing treatments. Their doses of investigational drugs are started at lower levels than other subjects.

The PharmGKB knowledgebase contains extensive data on genetic markers and their effect on specific medications. The organization's website (www.pharmgkb.org) includes dosing recommendations for many drugs.

In theory, physicians could have a genetic profile for each patient that allows for individualized prescribing for specific conditions. This process could work if the doctor is only prescribing a single medication. Once patients start taking a second drug, change their diets, or add vitamins and herbs, the individualized prescribing system may be unable to adjust. Prescribing codeine and amitriptyline is a relatively simple example of the difficulties involved. As discussed above, codeine is a pro-drug that needs to be metabolized, whereas amitriptyline works only in its unmetabolized form; yet both depend on the same enzyme system. Fortunately, we have alternative medications for this situation.

Some of the newer drugs are in a class by themselves. The guidelines for their use are based on clinical trials, which often exclude use of the drugs our patients are already taking. Starting new drugs in our patients requires an exercise in faith in the FDA guidelines and a lot of wishful thinking. In my field of neurology, many patients have both migraine and epilepsy. Will the new migraine drug give seizures, or will the new epilepsy drug prompt migraines? I don't know, nor is that knowledge in the literature that accompanies the new-drug handout.

The ability to do rapid genetic screening is here, and the cost is coming down. Perhaps a genetic screen before we write for a new drug would be appropriate, with a knowledgebase that could tell us if our drug is right for the patient and what the best dose might be. ◇

Author email: bernsteinallan@gmail.com
Letters to editor: osborn53@sonic.net

Does Genetic Testing Help Infertile Patients?

Jennifer Ratcliffe, MD, PhD

The field of reproductive endocrinology and infertility is splitting in two. Many reproductive endocrinologists now find themselves treating more *fertile* women than *infertile* women. Infertility is no longer their specialty; reproduction is.

Just like plastic surgery arose from reconstructive medicine, so too is the field of reproductive medicine arising from infertility medicine. Patients with the resources and desire can now choose among their embryos to select their baby's gender and its likely skin tone, eye color and hair color. Some patients choose based on cultural norms, some for family balancing and some for personal reasons. Large multi-practitioner centers cultivate and specialize in treating these patients.

I choose not to. I like to solve problems. I want to help women have the child they desperately want when the road seems blocked. I don't find it a challenge to help fertile patients choose what they think they want in a child. To me, that is cosmetic, technical work, not the art and practice of medicine.

Dr. Ratcliffe is a Santa Rosa reproductive endocrinologist and infertility specialist.

The contrast between reproductive medicine and infertility medicine is startling. On the one hand, it is possible for a patient to have a lighter-skinned, blue-eyed boy on a whim. On the other, there are patients who have exhausted all of their emotional and financial resources and still don't have a baby. How is this possible?

First, some basics. In humans under 38 years old, only about one in 20 mature eggs fertilized in vitro will result in a baby.[1] When embryos are manipulated in the in-vitro fertilization lab, this ratio is even lower. Human reproduction is an inherently inefficient process, yet the world is overpopulated because humans have an extraordinarily high number of chances to reproduce—about 500 times in the average woman's life span (figured at 13 times a year from age 12 to 52). Multiple chances compensate for inefficiency.

Second, the primary driver of pregnancy is the *egg*—not the sperm, not the uterus. The sperm functions as a key to start the engine and then is relatively dormant until just before implantation. The formation of the healthy embryo that is implanted in the uterus is directed by the many RNA species in the cytoplasm of the egg. The egg chromosomes (genetic material) are also relatively inactive in the process of embryo formation, and the uterus is mostly passive in establishing a pregnancy. Although the uterus forms receptors for the embryo to stick to, the embryo must make the proteins to stick to those receptors. Then the embryo's trophoblast cells (the placenta) burrow into the uterine lining and establish the exchange of nutrients that the embryo needs. The uterus is like the soil in this respect: the roots do the work, not the soil.

Physicians can screen embryos for chromosome copy numbers and genetic disease by removing a few cells from the developing blastocyst embryo—an embryo with between 100 and 120 cells that is ready to hatch out of its shell (*zona pellucida*) and implant in the uterus. The biopsy process has been shown to have a low risk to the embryo,[2] but in order to test embryos, they must be at the blastocyst stage of development. This means they must grow for five or six days in the embryology lab rather than in the tubes or uterus of a woman. That is hard for embryos. In fact, some normal embryos that would otherwise develop into healthy children will die in culture in the lab.[3]

Many patients and physicians get confused by the difference between *implantation* rates and *pregnancy success* rates. Compared to day 3, implantation rates at day 5 are higher for blastocyst embryos (80% vs. 60%) ; but the pregnancy success rate is higher for all the embryos available for transfer on day 3 if the embryos are transferred at day 3 instead of day 5 (60% vs. 40%).[4]

Table 1.

Implantation on day 3 vs. day 5

	Day 3	Day 5
Embryos available	10 of 10	5 of 10 (50%)
Successful implants	6 (60% of 10)	4 (80% of 5)
Babies	6 (60% of 10)	4 (40% of 10)

5th Annual

Asian & Pacific Islander Health Forum

Aging with Dignity: Preparing for Graceful Transitions

Thursday, May 18, 2017

10:00 am - 4:00 pm

Finley Community Center
Person Senior Wing
2060 West College Avenue · Santa Rosa, CA 95401

Presented by: Santa Rosa Family Medicine Residency Program

GOALS: The ASIAN & PACIFIC ISLANDER HEALTH FORUM is Northern California's fifth annual health education forum focusing on the Asian and Pacific Islander Communities. Our goals are to inform professionals about the most relevant challenges facing the Asian/Pacific Islander population in Sonoma County, to enhance access and quality of health services for the Asian/Pacific Islander community, and to facilitate networking among healthcare and other service providers.

WHO SHOULD ATTEND:

- Primary Care Providers
- Community Health Center Staff
- Healthcare Professionals
- Community Healthcare Workers
- Behavioral Health Workers
- Social Service Workers
- Community Leaders
- Healthcare Advocates

CONTACT:

Melissa Cerda, Asian Health Forum Coordinator
707-490-6130 • FAX 707-708-7713 • apihealthforum@gmail.com

Seating is Limited - Sign Up Early!

Imagine that a large fertility center is treating 10 women for day-3 implantation. If all those women receive embryos on day 3, six of the embryos will be successfully implanted (60% implantation rate) leading to six babies (60% pregnancy rate).

Now imagine that the same fertility center is treating 10 other women for day-5 implantation. Only five of those women will be able to receive embryos on day 5 because only half the embryos (50%) will survive to blastocyst stage. Of those five embryos, four will be successfully implanted (80% implantation rate), leading to four babies (40% pregnancy rate).

In other words, 10 embryos will result in six babies if implanted on day 3, but 10 embryos taken to blastocyst stage on day 5 will result in only four babies—a much lower rate (Table 1).

Infertile women have fewer eggs available, thus fewer embryos to culture. Because most of infertility is due to factors within the eggs, infertile women also have fewer embryos that grow well in culture. Thus 40% of infertile women won't have *any* embryos that make it to the blastocyst stage.[5] If the embryos were transferred sooner, they might result in a baby. In other words, the attempt to grow embryos for genetic testing may kill all the embryos and *harm* the patient. For an excellent counterpoint to the age of genetic medicine, see the article by Orvieto and Gleicher.[6]

So what's going on? It's everything else in the cytoplasm of the embryo—not the chromosomes—that largely controls blastocyst formation. Treating infertile women is like having a fleet of cars in California that you can't seem to start or test drive, but you still hope that one car can get to New York. If you add genetic testing, now you are able to check the hoses, but nothing else. That may help a few cars, but since the vast majority of engine function isn't dependent on the hoses, checking the hoses won't help much.

Reproductive medicine is different. Fertile couples have cars that are working and can definitely get to New York. Genetic testing and manipulation is simply cosmetic—changing the color

or the tires. Nonetheless, this technology sounds cool and generates a lot of income for doctors who choose to specialize in "designing" babies. The internet, newspapers, magazines and even reproductive endocrinology journals now feature articles about genetic testing and manipulation of embryos because it works well and sounds good.

In reality, genetic testing and manipulation sets up infertile women for even more disappointment when they get the impression that physicians can fix embryos, fix infertility and get everyone pregnant with a perfect, healthy baby. It would be helpful if we could make this dichotomy obvious to patients; but it's hard to do when so many confusing messages are out there. ◇

Author email: drratcliffe@afamd.com
Letters to editor: osborn53@sonic.net

References

1. Jones HW, et al, "Reproductive efficiency of human oocytes fertilized in vitro," *Facts, Views & Vision in Ob-Gyn,* 2:169-171 (2010).
2. Scott RT, et al, "Cleavage-stage biopsy significantly impairs human embryonic implantation potential while blastocyst biopsy does not," *Fertility & Sterility,* 100: 624-630 (2013).
3. Shen, S, et al, "Day 2 transfer improves pregnancy outcome in *in vitro* fertilization cycles with few available embryos," *Fertil Steril,* 86:44-50 (2006).
4. Martikainen H, et al, "Day 2 elective single embryo transfer in clinical practice," *Human Repro,* 19:1364-66 (2004).
5. Blake DA, et al, "Merits of blastocyst versus cleavage stage embryo transfer: a Cochrane review," *Human Reprod,* 19:795-807 (2004).
6. Orvieto R, Gleicher N, "Should preimplantation genetic screening be implemented to routine IVF practice?" *J Assist Repro Gen,* 33:1445-48 (2016).

References for pages 13–14

1. Roberts JS, et al, "DTC genetic testing," *Public Health Genomics Online First,* (Jan 10, 2017).
2. Pascal S, "DTC genetic testing," *Yale J Bio & Med,* 86:359-365 (2013).
3. NIH, "Your guide to understanding genetic conditions," ghr.nlm.nih.gov (2017).
4. Wade CH, Wilfond BS, "Ethical and clinical practice considerations for genetic counselors related to DTC marketing of genetic tests," *Am J Med Gen,* 142C:284-292 (2006).
5. FDA, "Inspections, compliance, enforcement and criminal investigations," www.fda.gov (2013).
6. Bloss C, et al, "Consumer perceptions of DTC personalized genomic risk assessments," *Gen Med,* 12:556-566 (2010).
7. Green RC, et al, "Disclosure of APOE genotype for risk of Alzheimer's disease," *NEJM,* 361:245-254 (2009).
8. Heshka JT, et al, "Systematic review of perceived risks, psychological and behavioral impacts of genetic testing," *Gen Med,* 10:19-32 (2008).
9. Carroll JC, et al, "Primary care providers' experiences with and perceptions of personalized genomic medicine," *Can Fam Physician,* 62:626-635 (2016).
10. Powell KP, et al, "Primary care physicians' awareness, experience and opinions of DTC genetic testing," *J Gen Counseling,* 21:113-126 (2012).

SONOMA COUNTY INDIAN HEALTH PROJECT, INC.

2016 Clinic of the Year

PRESENTED BY CALIFORNIA RURAL INDIAN HEALTH BOARD

PHYSICIAN
JOB OPPORTUNITIES

Ambulatory Health Clinic

- Family Medicine physician, OB preferred
- Board eligible / board certified
- Obstetrical consultation readily available
- Satellite facility
- Paid license / no fees for DEA
- CEUs paid (pro-rated)

Sign-on bonus

Competitive salary · Excellent benefits · Loan assistance and retention program · Relocation allowance

Clinic days are Monday through Friday, closed most major holidays

Sonoma County Indian Health Project, Inc. is a nonprofit community outpatient health center established in 1971 with a mission to advance the health and well-being of American Indians living in our communities by providing access to quality, comprehensive and continuous health care.

SCIHP is surrounded by wonderful scenic hikes, miles of rugged Pacific coastline, towering redwood forests—close proximity to San Francisco.

All interested parties should send CV to scihp.hr@gmail.com.

YOU AND YOUR SPOUSE OR GUEST ARE CORDIALLY INVITED TO ATTEND

THE SONOMA COUNTY MEDICAL ASSOCIATION'S

17th ANNUAL

wine & cheese reception

Join SCMA and our hosts — Robert Rex (winemaker) and PJ Rex (business partner)

WEDNESDAY EVENING, MAY 24, 2017 • 5:30–8 P.M.

DEERFIELD RANCH WINERY

10200 SONOMA HWY., KENWOOD

A certified organic winery handcrafting "clean wines" with low sulfite and histamine levels

LOCATED IN THE BEAUTIFUL SONOMA VALLEY

www.deerfieldranch.com

Wines to be poured:

- 2014 White Rex
- 2014 Chardonnay
- 2012 Estate Syrah
- 2012 Malbec Cuvee
- 2006 Meritage, Rancho Salina
- 2012 Zinfandel, Los Chamizal

SCMA members and spouse or guest: **No charge**
Nonmembers: $35 per person
RSVP to Rachel, **525-4375** or **rachel@scma.org**

S·C·M·A

SCMA's annual Wine & Cheese Reception is an opportunity to gather with your colleagues and share a toast with the volunteer leaders of SCMA. We are eager to hear about the issues that are important to you and your practice with a glass of vino!

Sponsored by

MERCER
MAKE TOMORROW, TODAY

Our hosts, Robert and PJ Rex

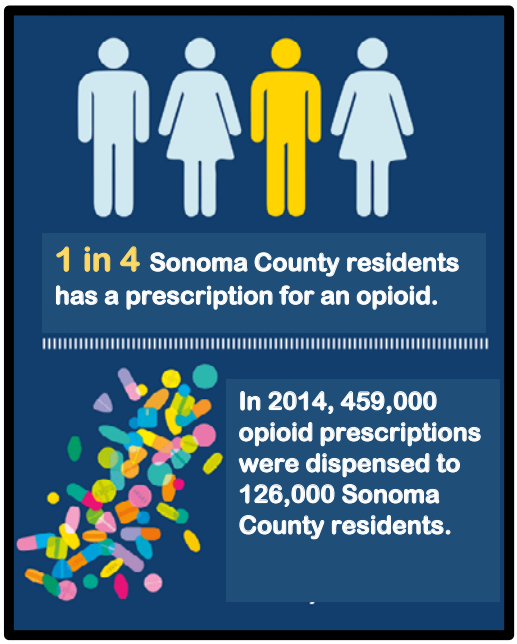
Sonoma County Guidelines for Prescribing Opioids

Karen Milman, MD, Lisa Ward, MD, Melissa Struzzo, MPH

Every eight days, someone in Sonoma County dies from an accidental drug overdose, and at least one-third of those deaths are from prescription opioids.[1] Local emergency departments and primary care providers are on the front lines of the prescription opioid epidemic, and they are key to bringing it under control.

In 2015, the Committee for Healthcare Improvement, a subcommittee of Sonoma County Health Action, convened an opioid prescribing work group to develop countywide guidelines for safe management of prescription opioids. The guidelines have since been completed, and they were implemented across Sonoma County in January. The guidelines standardize local opioid prescribing to known best practices and help ensure residents receive the highest quality of care and pain management while limiting unintended harm.

Separate guideline summaries have been developed for emergency departments and primary care offices, and they are reproduced on the following pages. The ED summaries are addressed to patients, but the primary care summaries are addressed to providers. The summaries are also available at the Sonoma Health Action website (www.sonomahealthaction.org/opioidprescribing), along with a detailed primary care guidance document. The guide walks clinicians through the steps of managing four different patient scenarios:


1 in 4 Sonoma County residents has a prescription for an opioid.
In 2014, 459,000 opioid prescriptions were dispensed to 126,000 Sonoma County residents.

- A new or existing patient with acute pain who is new to the possibility of being prescribed opioids.
- An existing patient with chronic pain not already taking opioids and the provider is considering starting opioid use.
- A patient with chronic pain already treated with opioid medication who is new to the health care provider's practice.
- A patient from one of the first three scenarios who has progressed to the point of having chronic pain and long-term/chronic opioid treatment.

In addition, the primary care guide describes organizational level interventions and recommends that clinical practices develop infrastructure and systems to support the effective implementation and monitoring of the guidelines.

The Sonoma County Health Action website also includes a clinician toolkit with information on the CURES database, clinical screening tools, patient education materials and current opioid research articles. The toolkit features a robust clinical guidance section with:

- opioid dose calculators
- tapering guidelines
- urine drug screen guidelines
- information on naloxone prescribing and medication-assisted treatment (MAT)
- cautionary medications information
- information on special populations, including pregnant women, children, adolescents and older adults.

Additional patient education materials about opioids are available at sonomacounty.ca.gov/Health/Services/Opioids. ◇

HEALTHACTION
A 2020 VISION FOR SONOMA COUNTY
Committee for Healthcare Improvement

Dr. Milman is the Sonoma County Public Health Officer. Dr. Ward is chief medical officer for Santa Rosa Community Health Centers. Ms. Struzzo is a health information specialist for the Sonoma County Department of Health Services.

Author email: melissa-struzzo@sonoma-county.org
Letters to editor: osborn53@sonic.net

Reference

1. California Dept. of Public Health, "2011-13 CDPH vital statistics DSMF and multiple cause of death file," unpublished analysis (2016).

SAFE PAIN MEDICINE
PRESCRIBING
IN EMERGENCY DEPARTMENTS

- We care about you. We are committed to treating you safely.
- Pain relief treatment can be complicated. Mistakes or abuse of pain medicine can cause serious health problems and even death.
- Our emergency department is committed to providing safe pain relief options. Many types of pain can be safely and effectively managed without prescription opioid medications.

For your SAFETY, we follow these guidelines when treating your pain:

1. We look for and treat emergencies. We use our best judgment when treating pain. These recommendations follow legal advice.
2. You should have only one provider and one pharmacy helping you with chronic pain. We do not usually prescribe pain medication if you already receive pain medicine from another health care provider.
3. If prescription pain medication is needed, we generally only give you a small amount.
4. We do not refill lost or stolen prescriptions. If your prescription is stolen, please contact the police.
5. We do not prescribe long-acting pain medicines such as OxyContin, MSContin, Fentanyl (Duragesic), Methadone, Opana ER, Exalgo and others.
6. We do not provide missing doses of Methadone or similar medications such as Subutex, Suboxone, or Buprenorphine.
7. We do not usually give opioid shots for flare-ups of chronic pain. Medicines taken by mouth may be offered instead.
8. Health care laws, including HIPAA, allow us to ask for your medical records. These laws allow us to share information with other health care providers who are treating you.
9. We may ask you to show a photo ID when you receive a prescription for pain medicines or other controlled substances.
10. We use the California Prescription Drug Monitoring Program, called CURES. This statewide computer system tracks opioid and other controlled substance prescriptions.

If you need help with substance abuse or addiction, call

707-565-7450

for confidential referral and treatment.

These standards were developed by the Committee for Healthcare Improvement in collaboration with the Sonoma County Department of Health Services and all Sonoma County Emergency Departments.

Sonoma County Department of Health Services · Kaiser Permanente · Sutter Health · Sonoma West Medical Center · St. Joseph Health Santa Rosa Memorial · Petaluma Valley · Sonoma Valley Hospital · Healdsburg District Hospital

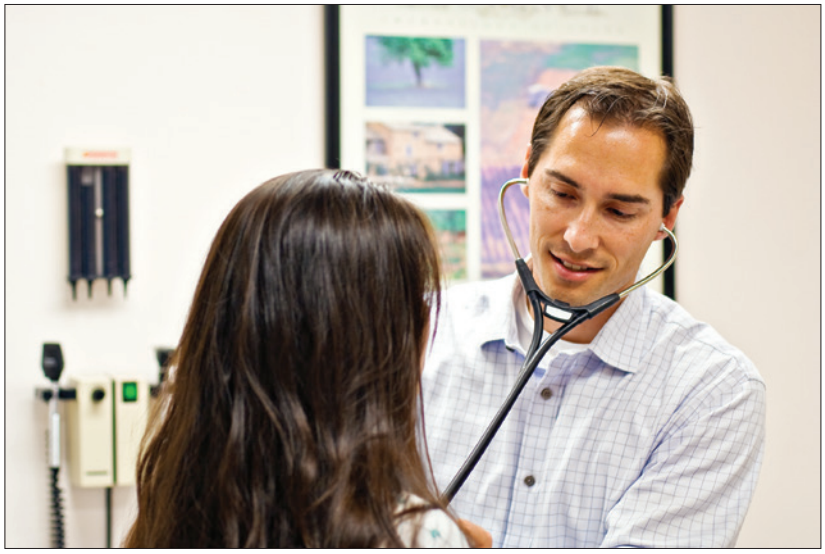
SAFE MANAGEMENT OF NON-PALLIATIVE PAIN
FOR PRIMARY CARE PROVIDERS

1. All patients need a comprehensive **initial assessment** comprised of a complete history, including both medical and social history; evaluation of functional level; a review of past medical records including any studies done and any treatments received; and a determination of whether or not there is a diagnosis for which opioid treatment is indicated.
2. Perform **risk assessments** to evaluate risk factors for opioid-related harms including co-morbidities, sleep apnea, mental health issues, and potential for medication misuse (past substance abuse, history of trauma or PTSD).
3. **Non-pharmacologic therapy** and **non-opioid pharmacologic therapy** should be tried first. Consider starting a **non-opioid regimen** such as NSAIDs or acetaminophen, and consider utilizing non-pharmacologic options such as self-care, exercise, physical therapy, behavioral health, peer or other support groups, mindfulness, acupuncture, yoga, and chiropractic or osteopathic care.
4. Establish **functional goals and a treatment plan**. Provide detailed patient education that includes the risks associated with opioid use. Plan for reassessment and discontinuation, and explain this to patients at the initiation of opioid treatment.
5. When starting patients on opioids, write a prescription for only a **short duration** (e.g., several days or weekly supply), and start with **short or intermediate acting medications**, and use the lowest dose necessary. Conduct a clinical re-evaluation **within days to 2 weeks** time of the initiation of treatment.
6. **Proceed with extreme caution when prescribing opioids for more than 60 days** and conduct an evaluation to determine if long-term use is appropriate. The efficacy of long-term opioid use for chronic non-palliative pain has not been established and there is a high rate of patients treated with chronic opioid medications who develop opioid use disorders.
7. **Monitor the patient** closely throughout treatment including performing a Urine Drug Screen at least annually, reviewing the California Prescription Drug Monitoring Program (CURES) at least twice a year, and having the patient sign a treatment use agreement (a.k.a. medication use agreement) and reviewing it annually.
8. At regular intervals, at least once every three months, **conduct a clinical re-evaluation** that reviews the functional goals and re-assesses the risks versus benefits of opioid treatment. If pain is not resolving as expected, try alternate treatments, consider specialty referrals, and consider discontinuation of opioids.
9. Considerations for Special Populations: 1) **Women of reproductive age** — when pregnancy is possible or if currently breast feeding, it is recommended that providers review the added potential risks of opioid use to the pregnancy and the fetus. **Co-prescribing contraceptives** is strongly recommended. 2) **Geriatric population** — consider the **additional level of risk** that opioid medications may create. Health care providers also need to do a complete medication reconciliation and evaluate potential drug interactions.
10. **Taper and/or discontinue opioids** if there is no clinically meaningful improvement in function and pain, **if patient is >90 MEDs**, or if treatment resulted in a severe adverse outcome (e.g. overdose, bowel obstruction, central sleep apnea), or if the patient has current or history of substance use disorder (excluding tobacco).
11. **Do not co-prescribe opioids with** benzodiazepines, sedative-hypnotics or barbiturates.
12. Set up an **agency practice infrastructure** to support safe and effective pain management.

These standards were developed by the Committee for Healthcare Improvement in collaboration with the Sonoma County Department of Health Services and Sonoma County Primary Care Providers.

A Conversation with Jason Cunningham, DO

Anastasia Coutinho, MD, MHS



Dr. Cunningham examining a patient at the West County Health Centers.

Dr. Jason Cunningham is medical director of West County Health Centers (WCHC), a federally-qualified health center and certified primary care medical home consisting of four primary care clinics and additional specialty clinics serving mostly Medi-Cal and Medicare patients. WCHC has designed a primary care system that puts the patient at the hub of care, rather than the provider. This design is intended to give providers and medical staff more autonomy in decision-making and to improve health outcomes and patient satisfaction.

Dr. Cunningham and I had the following conversation at WCHC on Feb. 21.

Before discussing the innovations in care delivery at WCHC, tell me why the system needed to be different.

Dr. Coutinho is a second-year resident at the Santa Rosa Family Medicine Residency.

We are all on a burning platform. We talk about a burning platform to illustrate a problem that is so big or so impactful that we are either going to put it out or jump off—we can't be complacent anymore.

What is the burning platform? Cost. When I finished residency 13 years ago, cost was still the burning platform. People had just started to talk about the drivers of health care, including cost and hospitalizations. People were not talking about high-cost, high-needs patients, nor about primary care as the foundation of the health care system. We are now recognizing the true cost of health care—three trillion dollars of annual spending—and it is on everybody's agenda. The percent of GDP spent on health care will be over 20% before we know it. That's one in five dollars that we're not spending on education, roads or other projects. That is the burning platform.

Chronic disease is the driver of that burning platform. Two-thirds of Medicare spending is for people with five or more chronic diseases, and 97% is on those with at least one chronic condition. Currently, providers are incentivized to do procedures, order tests and get images. For patients with chronic illnesses, providers can get more money from CT scans and interventions than from a 20-minute office visit.

We have created a disease care system rather than a health care system. We fundamentally need to shift our system to preventive care—primary care. We're being incentivized, even at federally qualified health centers, to provide disease care, where the more volume a provider sees the better. We are just starting to receive incentives for quality outcomes. Primary care, because of the long-term, trusted relationship with the patient, is influential for improving clinical quality and reducing unnecessary cost. If we incentivize primary care

and enable the kind of work and staffing necessary, we will make a significant impact.

What are three innovations that make WCHC special?

First: team. Team will look different for every system, but the fact that we have fully bought into team-based care has been the part I am incredibly proud of.

Second: human-centered design as a tool and a skill set. Bringing people into the solution as content experts and having a fun way of engaging is just as important as LEAN integration or quality improvement metrics.

Finally: data. Having data at your fingertips is a whole new world. People who have not invested in strategic data infrastructure will need to move over quickly. We now have access to tools that bring sophisticated analytics and visualization at a price point that is accessible to any size organization and can be managed by staff without complicated technology backgrounds. "Self-service analytics" is allowing the subject experts to become "citizen data scientists" and leverage the technology to have rapid insights and then act on them to drive value. Data infrastructure is readily available now, so if you're not investing in that infrastructure, you won't be thinking strategically.

Tell us a bit about how and why you restructured the team at WCHC.

In 2007, we opened the Sebastopol Community Health Center. Until that point, WCHC had Russian River Health Center and Occidental Health Center. Both health centers were started from the Johnson era War on Poverty and have met the needs of the communities they serve for over 40 years with roots in compassionate, relational care. But at the same time, patients had a different MA [medical assistant] every time they came in, and nobody had empanelment—the process by which individual patients are assigned to individual providers. When we opened Sebastopol, we purchased an electronic health record [EHR] system. Our executive director, Mary Szecsey, is a fantastic future thinker, and she suggested we use Sebastopol as our beta site for the EHR.

Sebastopol was our playground for rethinking what a team is. What does an MA do? What does a provider do? What does the front office do? What does a nurse do? We needed to rethink the EHR and how we were interacting with it, and in doing that, we rethought team structure and roles. Throughout the course of development, we got exposed to some thinkers in primary care—such as Doug Eby, Chuck Kilo and Tom Bodenheimer—who changed our world. These guys helped us understand that it's not about what actual system you create or which processes you adopt, it's about why you are doing it. We really needed to be clear about our principles of care.

In rethinking team, our main principle is that all of health care is about relationship. In fact, relationship is our primary product. Remember the Osler quote: "It is much more important to know what sort of a patient has a disease than what sort of disease a patient has." Patients are better cared for by one small group of people with deeper relationships: one provider and one MA, who form a teamlet. In the front office, the same person should call the patient each time. This is where our vision of team developed.

Behavior is a major determinant of health. Providers have very little to do with what patients eat, what they're addicted to, or what family support they have. The patient is really in control of behavior. That was a big driver for shifting the way we deliver primary care. The provider is less influential around behavior; it's more about the relational connection and the trust than with the diagnosis or the medicine. So we set up our system around the teamlet model and our relationship with patients.

Our staffing is totally different now. We have 1.2 nurses, 1.75 MAs, 1.75 front office staff and 1.0 behavioral health provider per medical provider, along with other enabling staff. It took about a year to figure out how the schedule would work with all these people. We realized that if we wanted nurses to be doing complex case management, they needed to just be doing that: they can't be doing triages or refills or other work. So, we decided to prioritize staffing numbers and increase our ratios, and it's made all the difference. It took about six years of rolling all this out to make it work.

So, long answer to your question: we've slowly increased our ratios as we've recognized how much it takes to do what we are trying to do. That took some courageous leadership and budgeting across our agency. We're fully vested in this concept of primary care as it's supposed to be. It's about getting out and doing relational care. We've gotten a little ahead of the curve, but we're still in transition in how we are reimbursed. To change quality, you need educators, nurse care managers and community workers. We don't get reimbursed for that, but we are trying to shift our world toward the future of value-based reimbursement, and we think that relational-based care is the answer. We're betting on our model.

To your second point of innovation, what is human-centered design?

One model for innovation is top-down leadership, with a really engaged leader pushing forward. Or you can flip innovation on its head and have people engage in the process. That is human-centered design: where the expert is not top-down, but rather the front-line staff or content expert, or the patient. You explore the problem together rather than telling what the answer is or what solution should be implemented.

We got funding from the Center for Care Innovation and the Blue Shield Foundation for certain staff to go through a human-centered design training similar to IDEO's model of innovation design, and that has transformed the way we do our new rollouts. We create staff teams to help us figure out problems.

We also built an innovation hub—a physical space dedicated to innovation activity. If you're in the middle of your work and someone is asking you questions, you can't even think straight, much less be creative. We have an innovation

project manager and innovation director whose main focus is to help us facilitate these projects.

Tell me what you can do with your third innovation: data.

We've become known for our data; especially taking data and visualizing it in a different way. [*At this point, Dr. Cunningham showed me how he can take all of his patients' addresses and various electronic health record data to visualize patient characteristics and outcomes in a new way.*]

For instance, we examined the location of all patients who had an opiate on their medication list. Then we were able to heat map the data morphine equivalents and recognize that patients living in a specific geographic location had much higher amounts of opiates prescribed. The ability to visualize data in this way changes the conversation as to where to focus our energy as a clinic, and as a community.

Here's another example. What if we wanted to examine high-cost users? Of this subset of patients (1,500) let's see how many of them equal 40% of the total cost. Instead of 1,500, which seems like a lot, it's really 106 patients, which is doable. We can start to examine this smaller group of people.

Another example where we are really thinking about data differently is examining the work we don't get paid for. Who are the people calling in the most for refills, or how many extra documents to review or sign do you get from certain patients? By using this data, we determined that 10% of our patients use 50% of our staff's time. How can we alter our system to change this time spent?

In all of these examples, going backwards, can data change the way we are looking at outcomes? How do we use data visualization as a way to drive clinical outcomes or use our staff in different ways?

Our biggest change has been to use a data program called Tableau, which is basically a layperson's way of visualizing data. You don't have to have a data scientist or a data design degree. It's $1,500 one-time purchase; that's it. The point is to make the end-user the content driver and the editor. Our quality improvement numbers are finally making steady improvements because each staff member has access to the data and the training to understand it. Our MAs and our front office are accessing Tableau. They help design the dashboards and reach out to patients. It's a culture shift.

> "People are going to want to have relationships with primary care, and they are going to ask us to do more. We have to be ready for that."

How can primary care bring in specialists and other sectors of health care?

We have great specialist partners. They might say, "I don't get great information from primary care doctors, and I don't have the nursing staff to send you documentation or coordinate care." But, for geriatric populations and other high-cost outliers who are clinically complex, we have nurses reaching out to specialists to improve coordination. Specialists benefit if we can figure out these more complex patients.

Specialists and primary care are benefitting differently from the current reimbursement model and will need to navigate the transition toward value-based reimbursement on somewhat different paths. In a closed system, shared responsibility and shared risk make it easier to see a clear path forward. In a more traditional model, we will need to work strategically toward a system where primary care can offer care coordination and patient engagement while allowing specialty care to offer needed clinical consultation and interventions.

If health care reform incentivizes these other sectors to collaborate with primary care, things will change. For example, if reform changes hospital readmission reimbursement in a steeper way, hospitals are going to start figuring out how to do things differently. All I can say is relationship matters, and we have the long-term relationship. If hospital readmission matters, we have the relationship. The patients leave the hospital and come to us. We need to figure out how to work together. People are going to want to have relationships with primary care, and they are going to ask us to do more. We have to be ready for that.

Is Sonoma County ahead of the game in terms of innovation?

Definitely. The county just got an Accountable Communities of Health grant, which is a way for us, as a county, to develop a different payment methodology for services that typically do not get reimbursed. The payment methodology is a good example of the products we can't develop individually. This is especially true when it comes to social determinants of health and cost outliers. We have a real need to work together across health systems or non-traditional health partners to influence complex health issues. If we don't work together, individual outcomes are going to suffer.

Leadership at the county level and in local health care has a strong vision of moving forward and doing something together. There is a real synergy there.

Is there anything you'd like to add?

Health care is changing so rapidly. When I look back on these years in the future, I want to know we've influenced individuals and people's lives. This is an incredibly interesting time to be in leadership within health care. I am convinced that primary care will help move our health system toward a more sustainable and effective model, if we focus on human-centered care and relationship as the central intervention. ◇

Author email: coutinaj@sutterhealth.org
Letters to editor: osborn53@sonic.net

MYSTERY CASE

A Traumatically Broken Contraceptive Implant

Douglas Jimenez, MD

A 25-year-old woman with two successful pregnancies was seen for a complaint of pain in her upper inner left arm, specifically the site of an etonogestrel-releasing implant (Nexplanon) placed one month prior. The patient reported being shot in the implant location with a paintball a few days before the visit. She was wearing only a thin jacket at the time, and she immediately noted pain and bleeding from the insertion site. A blister formed shortly thereafter. She ruptured the blister and extracted what she thought was a small piece of the implant, approximately 0.5 cm long, which she discarded. She subsequently presented at our clinic for evaluation.

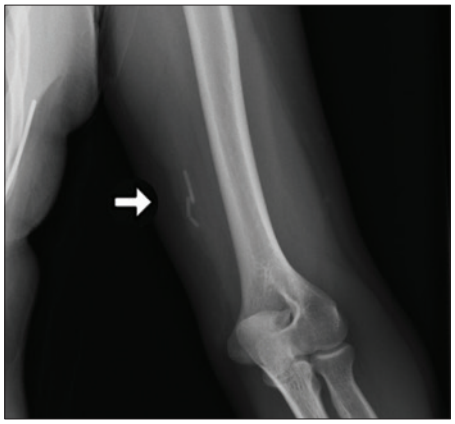


Figure 1. Fractured implant in arm

Figure 2. Implant separated

Figure 3. Implant rejoined

Physical examination found discoloration at the site of impact, along with a healing scab. An x-ray showed the subdermal implant, now fractured into possibly four separate pieces (Figure 1). The fractured implant could be readily palpated and appeared to be in at least two pieces. Two simple incisions were made, and the remaining 3.5 cm of the 4 cm implant were removed (figures 2–3). A confirmatory x-ray after the procedure showed complete removal of the fractured implant (Figure 4). The patient elected to replace the implant two months later.

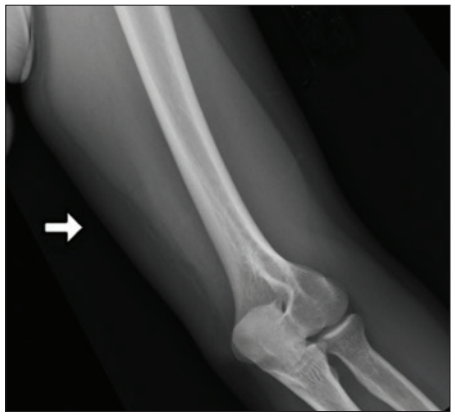


Figure 4. Arm after implant removed

The etonogestrel single-rod contraceptive implant is one of the long-acting reversible contraceptive (LARC) methods currently available in the United States. It was approved by the FDA in 2006 for three years of use. Millions of women worldwide have received the implant; exact numbers are not well defined. Its mechanism of action is twofold: inhibition of ovulation and thickening of the cervical mucus. The contraceptive effectiveness of the implant is very high, with only an estimated 0.1% of users becoming pregnant during the first year of use.[1]

Encouraging the use of LARC methods for appropriate candidates may help lower the unintended pregnancy rates because gaps in use and discontinuation of shorter-acting methods are associated with higher unintended pregnancy rates in high-risk women.[2] Typical-use pregnancy rates for LARC methods are lower, and continuation rates are higher, when compared with oral contraceptives.[3] Eligibility criteria for etonogestrel single-rod contraceptive implants are widely available;[4] the most common side effect is unpredictable uterine bleeding.[5]

A review of the literature uncovered only a few case reports of broken implants.[6,7] Interestingly, these cases have mostly been spontaneous. In one case, the patient was grabbed strongly directly over the implant. The manufacturer's website includes reports of implants that were broken or bent while in the patient's arm. The prescribing information for Nexplanon notes that, based on *in vitro* data, the release rate of

Dr. Jimenez is a Santa Rosa family physician and faculty at the Santa Rosa Family Medicine Residency.

IHM INSTITUTE FOR HEALTH MANAGEMENT

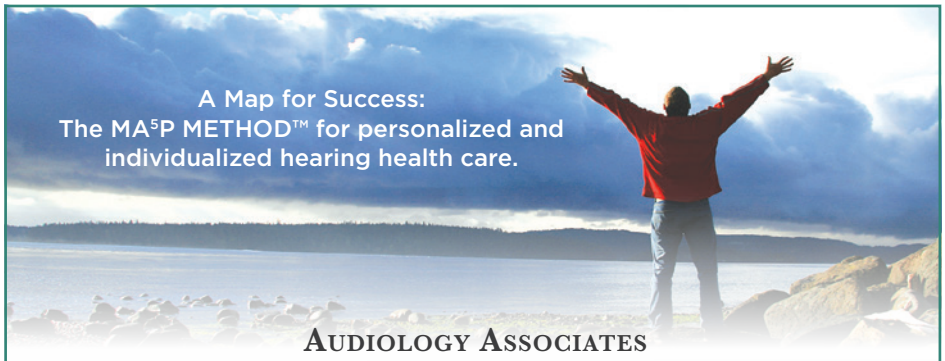
A Medical Clinic / David Chappell, M.D., Medical Director

THE SAFE, EFFECTIVE APPROACH TO RAPID AND PERMANENT WEIGHT LOSS

• Medically Supervised • Nutritional Counseling
• Registered Dietician • Long Term Weight Maintenance

715 Southpoint Blvd., Suite C
Petaluma, CA 94954
(707) 778-6019 778-6068 Fax

350 Bon Air Rd., Suite 1
Greenbrae, CA 94904
(415) 925-3628



Audiology Associates

Offers Solutions to Balance and Tinnitus Problems

Balance Care Program Audiology Associates is devoted to restoring and maintaining the function of the auditory and vestibular system in its Balance Care Program, where patients receive care in a program designed with the latest technology and methods for properly evaluating and diagnosing balance conditions.

Tinnitus Care Program People suffering from tinnitus may experience whistling, hissing, buzzing, ringing or pulsing in the ear that persists even in the absence of external sound. Audiology Associates' comprehensive Tinnitus Care Program provides the most advanced diagnostics and treatments available to help patients manage this condition.

Audiology Associates
hear today, hear tomorrow

Peter J. Marincovich, Ph.D., CCC-A
Director, Audiology Services

Samantha C. Lenzini, B.S., Au. D., Extern
Clinical Audiology Extern

Visit Dr. Marincovich's **BLOG** at **drpetermarincovich.com**

Three Offices Serving the North Bay

SANTA ROSA
(707) 523-4740

MENDOCINO
(707) 937-4667

MILL VALLEY
(415) 383-6633

MEMBER OF AUDIGY
AUDIGY GROUP

See our website for more information
audiologyassociates-sr.com

etonogestrel may be slightly increased when an implant is broken or bent.[8] Whether this increase has physiological implications is unclear, but at least one case report suggests that it may lead to increased bleeding.[9] The manufacturer's only specific suggestions for broken or bent implants are that patients should see a provider and that the implant should be removed in its entirety.

Counseling for etonogestrel-releasing implants should include advising patients to protect the implant site during high-risk activities that might damage the implant. There is no evidence-based recommendation for how to manage a broken implant, but most experts and the product manufacturer recommend removal. Such removal is facilitated by appropriate imaging studies and additional incision sites, if indicated. ◇

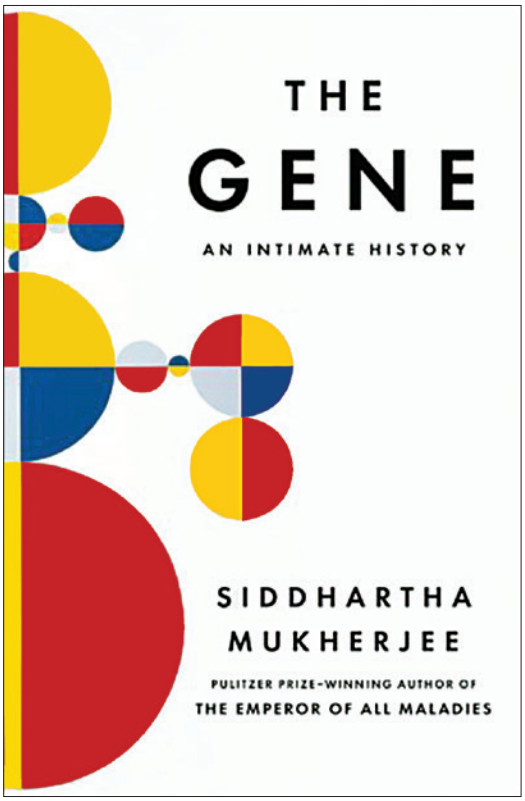
Author email: DouglasJ@srhealthcenters.org
Letters to editor: osborn53@sonic.net

References

1. Trussell J, "Contraceptive failure in the United States," *Contraception*, 83:397-404 (2011).
2. Raine TR, et al, "One-year contraceptive continuation and pregnancy in adolescent girls and women initiating hormonal contraceptives," *Ob Gyn*, 117:363–71 (2011).
3. Hatcher RA, et al, *Contraceptive Technology*, 19th ed, Ardent Media (2007).
4. Curtis KM, et al, "U.S. medical eligibility criteria for contraceptive use," *MMWR Recomm Rep*, 65:1-66 (2016).
5. Curtis KM, Peipert JF, "Long-acting reversible contraception," *NEJM*, 376:461-468 (2017).
6. Agrawal A, Robinson C, "Spontaneous snapping of an Implanon in two halves in situ," *J Fam Plann Reprod Health Care*, 29:238 (2003).
7. Pickard S, Bacon L, "Persistent vaginal bleeding in a patient with a broken Implanon," *J Fam Plann Reprod Health Care*, 28:207-208 (2002).
8. Merck, "Nexplanon: Highlights of prescribing information," www.merck.com (accessed March 6, 2017).
9. Torres R, et al, "In situ breakage of Implanon," *Contraception*, 88:189–191 (2013).

Our Manual of Instructions

Stephen Meffert, MS, MD, Liana Meffert, BS



The Gene: An Intimate History, Siddartha Mukherjee, 608 pages, Scribner (2016).

Our ability to read out this sequence of our own genome has the making of a philosophical paradox. Can an intelligent being comprehend the instructions to make itself?

—John Sulston

In *The Gene: An Intimate History,* Siddhartha Mukherjee leads an unflinching inquiry into our lowest common denominator, weaving a story rich in culture and steeped in philosophical, moral and personal insights. The simplest form of our selves, our DNA, becomes larger than life as Mukherjee sketches out the greater implications of our genetic code. He offers a history of genetics, working in the chronological and thematic order of people's "desire to decipher our manual of instructions."

Much like the *Emperor of All Maladies,* Mukherjee's well-received tome on the history and future of cancer, *The Gene* is framed in the context of his own life and fears. Near the beginning of this intimate work, he details the mental illness that consumed the lives of two of his father's five brothers and permeates his family. Ultimately, he narrates his brothers' disorders as parallel diseases: Rajesh, who was never formally diagnosed, but whom Mukherjee suspects passed away during an acute manic phase of bipolar disease; and Jagu, who was diagnosed with schizophrenia. Moni, a cousin, was also diagnosed with schizophrenia and confined to a mental hospital in Calcutta.

The mystifying capabilities of genetics play another role in Mukherjee's life, in the form of his mother and her identical twin. They provide striking evidence for the difference in phenotypic traits that can occur despite identical genomes. Mukherjee details the contrast of temperaments: his mother's bombastic nature and his aunt's quiet reserve despite, as he puts it, sharing the first derivative of identity. While the family stories provide the element of humanity that infuses much of Mukherjee's work, they also create mystery and trepidation. Where in the familial genetic line is the seed of mental illness planted, and when will it spring forth again?

Mukherjee is quick to acknowledge the intricate, sophisticated and sometimes aggravatingly simple beauty of biology. As Francis Crick, one of the scientists credited with discovering the structure of DNA, wrote, "It is the molecule that has the glamour, not the scientists." The double helix of DNA is the only biological diagram Mukherjee chooses to reproduce in his text, exalting in the spiral staircase with rising steps linked together through molecular forces between the A:T and G:C pairs.

In the prologue to *The Gene,* Mukherjee writes, "This book is the story of the birth, growth and future of one of the most powerful and dangerous ideas in the history of science: the 'gene,' the fundamental unit of heredity, and the basic unit of all biologic information." He goes on to observe that the atom, the byte and the gene are the fundamental units of their scientific fields. The rapid acceleration of knowledge in physics and computer science after a fuller understanding of the atom and the byte is

Dr. Meffert is a Santa Rosa retinal specialist. Ms. Meffert is currently completing a neuroscience research fellowship at the NIH.

now occurring in the biological sciences after a fuller understanding of the gene.

The primary structure of *The Gene* is a simple narrative arc beginning with the first human thoughts regarding inheritance and progressing to the latest attempts to edit the human genome. In later pages, Mukherjee contemplates the philosophical and ethical implications of an animal not only able to read its instruction manual, but to rewrite it. The book provides a linear history of our understanding of inheritance, from mystical vapors and the paternalistic sperm homunculus to the discovery of a biological unit of inheritance. Geographically, the history travels from the ancient Greek philosophers (Pythagoras, Aristotle, Plato), to the scientists of Europe (Mendel, Darwin, Crick) and finally on to America, with its globalized academics and biotechnology.

At all points along the journey, Mukherjee documents, in exquisite detail, the drive and seeming need for humans to understand the process of inheritance. His history lesson could be dry and dull, but his painstaking research and incorporation of personal and societal details make the lesson more interesting and place the science and scientists in a social context. In fact, the history and the character development of the central players is one of the most intriguing aspects of *The Gene*. At times the book reads more like a mystery novel than a dry scientific tome.

Following the historic arc of discovery, Mukherjee tackles the all-encompassing implications of this discovery's power. Here the book takes on a more somber and ominous tone. Scientists are born and bred to push the boundaries, to go further and do more, to apply knowledge and develop new techniques. If it's possible, it will be done . . . by someone, somewhere. In physics, Einstein realized that all the pieces of knowledge were in place to develop a weapon of inconceivable power, the atom bomb; thus the bomb became more a question of when and who than if. As Mukherjee explains, we are currently at this precipice in the biological sciences. Despite the global implications of nuclear weapons, the current precipice in biology is more fundamental and far-reaching. The knowledge exists to permanently change evolution and the trajectory of life on earth.

Mukherjee does not back away from genetic science's potential for evil. He gives readers fair warning through a review of our propensity to manipulate heredity. Nefarious attempts over the last century—eugenics, forced sterilization, and "racial hygiene"—illustrate that the danger is not abstract. Mukherjee describes the American-born eugenics movement of the 1920s and the admiration its leaders had for the Nazis' vast governmental eugenics program. Given this history and our more powerful tools of today, he emphasizes the need, more pressing than ever, to carefully consider the ethical ramifications of genetic manipulation.

Some of the earliest attempts by geneticists to develop an ethical framework for their studies occurred at a 1975 conference in the Asilomar center, not far from Monterey. A contest emerged between the unfettered pursuit of knowledge and the ethical implications of genetic tampering, but ultimately a consensus was reached to limit experimentation. Over the years, the conferences have continued, and the consensus is still to limit genetic manipulation, particularly in humans. Western societies have adhered to this consensus, but the globalization of knowledge has created an opening for scientists, in less ethically and institutionally constrained societies, to move beyond these boundaries.

In 2015, scientists in China reported the first successful genetically engineered human embryos. Even in the US and UK, recent scientific and legal reviews have approved the selection of embryos to avoid fatal genetic diseases. While this approval is hardly controversial, we have begun moving down the slippery slope of genetic selection. Mukherjee urges the physician scientist to understand and consider the ethical implications of the coming wave of genetic interventions, lest decisions be made by legal and political means.

Mukherjee presents us point-blank with what lies within us. He unravels himself and he unravels us by telling the story of our understanding of genes and cautioning about its power. The stewardship of our genome, Mukherjee concludes, "may be the ultimate test of knowledge and discernment for our species."

Toward the end of the book, Mukherjee broaches the "last mile" problem of genetics: How do we make the leap from genetic propensities to tangible personhood? Where is the decision, or non-decision, in that? The presence of a gene is indicative of what *may* happen, not what *will* happen. The answer, Mukherjee tells us, is chance. He is enchanted. Our genes are a set of conserved instructions with just enough room for the "intersection of fate." ◇

Author emails: nbvcmd@nbvcsr.com, lmeffert@sonic.net
Letters to editor: osborn53@sonic.net

MEDICALLY SUPERVISED WEIGHT LOSS PROGRAMS
LED BY DR. GAIL ALTSCHULER

GAIL ALTSCHULER, MD
MEDICAL DIRECTOR

marin
WEIGHT LOSS &
WELLNESS

My dedicated team and I have the knowledge and expertise to craft individualized weight loss plans for your patients.

You can count on us to:

- Address the root cause of weight-related medical issues
- Provide the support and skills your patients need to make lasting changes to lose and maintain their weight for life
- Deliver professional health, nutrition and wellness education
- Keep you fully informed on your patient's progress

Let us help you tackle this complex issue!

415-897-9800

GREENBRAE • NOVATO | WWW.MARINWEIGHTLOSS.COM

Sugar's Toxic Toll

Robert Schulman, MD

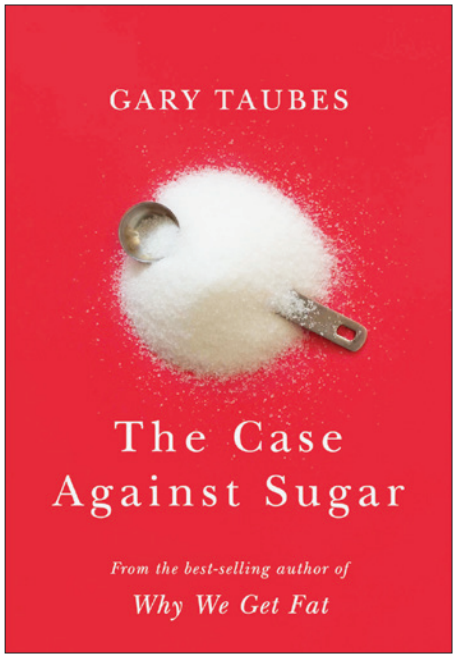
The Case Against Sugar, Gary Taubes, 384 pages, Knopf Doubleday (2016).

In the manner of diet—I have been persistently strict in sticking to the things which didn't agree with me until one or the other of us got the best of it.

—Mark Twain

In 2002, the science journalist Gary Taubes wrote a *New York Times Magazine* cover story called "What if It's All Been a Big Fat Lie?" His well-received article presented the science behind the hypothesis that carbohydrate restriction can lower obesity and diabetes. He spent the next five years working on his tour de force, *Good Calories, Bad Calories* (2007), in which he elaborated on his thesis that much of what we'd been taught about fat, heart disease, exercise, obesity and diabetes was probably wrong. In 2009, Taubes again had the cover story of the *New York Times Magazine*, this time entitled "Is Sugar Toxic?" Next came the layperson's version of *Good Calories, Bad Calories*. That book, *Why We Get Fat* (2011), was intended for readers who might be unable to wade through the layers of carefully crafted argument of his heavier tome.

Taubes' science background is solid, with Ivy League degrees in physics, engineering and journalism. His investigative reporting prior to breaking the "low carb" story focused on "bad science." In addition to his reporting, Taubes and the Stanford-trained general surgeon Dr. Peter Attia, with backing from energy-trader-turned-philanthropist John Arnold, have created the Nutrition Science Initiative, a nonprofit research organization devoted to answering one of the most pressing questions in nutrition science: What is making us all so fat, and what can we do about it?



The case against sugar

In his most recent book, *The Case Against Sugar*, Taubes seeks to indict sugar, arguing that sugar may be the cause not only of diabetes, but also of the "diseases of Western civilization," including heart disease, gout, hypertension and cancer.

In the introduction, he sets out to gather what he submits is a preponderance of evidence to indict sugar as the causative agent of diseases, including nonalcoholic fatty liver disease, which affects an estimated 64 million people in the United States at an annual direct medical cost of $103 billion; type 2 diabetes (29 million people, $176 billion cost, and 11% of all deaths); and even Alzheimer's (5.4 million people, $214 billion cost).[1–4] Taubes argues that these are all "crimes" committed by sugar.

Taubes is not a lone wolf howling into the night. The many academic researchers making the same argument about sugar include at least three well-known physicians: British cardiologist Dr. Assem Malhotra and the pediatric endocrinologists Dr. Robert Lustig (UCSF) and Dr. David Ludwig (Harvard), all of whom are quite vocal about sugar's toxic toll.

Dietary fat is not the cause

Nutritionists have historically embraced two big ideas, according to Taubes, and he contends that both are incorrect. The first is that fat in the diet is the cause of chronic disease; the second is that eating more calories than expended ("calories in, calories out") causes obesity. These two ideas, which comprise the core tenets of Taubes' thesis, are arguably the most contentious. The alternative hypothesis posited by Taubes and many others is that obesity is a fat accumulation disorder: a hormonal/regulatory defect in which the macronutrient content of food determines how the food is utilized and compartmentalized—stored as fat or used as fuel.

Taubes interprets the statement that "obese people are fat because they eat too much" as a tautology. To Taubes, such a statement is as meaningless as saying that poverty is caused by not earning enough money, or alcoholism by drinking too much. These statements are descriptive, not explanatory. They explain *what* happens when people get fat, or poor, or addicted to alcohol, but not *why* these events happen.

Taubes examines the why of obesity

Dr. Schulman is a physiatrist and pain medicine specialist with offices in Santa Rosa and Sebastopol.

at length, particularly why the obese cannot mobilize energy stores from their fat tissues. He cites the pre-World War II work of the German internist, Dr. Gustav von Bergmann, who asked why excess calories were trapped in fat tissue, rather than expended for energy. Taubes goes on to cite researchers such as the Austrian endocrinologist, Dr. Julius Bauer, who noted, "If an obese person could not mobilize energy from fat stores, these calories would be removed from circulation and the individual would continue to be hungry." The idea that obesity was a hormonal/regulatory disorder, a fat-trapping disorder, was well accepted in Europe in those years, but it vanished in the wake of the war and subsequent dismissal of German science.

The why of obesity, argues Taubes, was revealed in the 1960s with the development of radioimmunoassays, by Rosalyn Yalow and Solomon Berson, and the ability to measure hormones, specifically insulin. Yalow and Berson described insulin as a "lipogenic hormone" and additionally reported that patients with type 2 diabetes, as well as the obese, tended to have elevated levels of blood sugar and abnormally high levels of insulin. These insights established definitively that type 2 diabetes is a disorder of insulin resistance, not of deficiency, as in type 1 diabetes.

Also in the 1960s, Dr. Robert Atkins declared that carbohydrate ingestion and the resultant insulin response was uniquely fattening. The way to weight loss, he said, was his now infamous "Atkins diet." For years, the Atkins diet was vilified as the worst of quackery, but more recently, through the work of Eric Westman, William Yancy, Jeff Volek and Steve Phinney (all clinical investigators working in academia), the diet has been found to have merit as a potentially valid and safe weight-loss intervention and treatment for diabetes.

The if/then hypothesis

In *The Case Against Sugar,* Taubes presents his main argument as an if/then hypothesis, quoted at length below:

> If these Western diseases are associated with obesity, diabetes, insulin resistance and metabolic syndrome, which many of them are, then whatever causes insulin resistance and metabolic syndrome is likely to be the necessary dietary trigger for the disease, or least a key player in the causal pathway. Because there is significant reason to believe that sugars—sucrose and high fructose corn syrup in particular, the nearly fifty-fifty combinations of glucose and fructose—are the dietary trigger of insulin resistance and metabolic syndrome, it's quite likely they are a primary cause of all these Western Diseases, including, as we'll discuss, cancer and Alzheimer's disease. Without these sugars in the diet, these chronic diseases would be relatively rare, if not, in some cases, virtually nonexistent.

The key question, says Taubes, is whether "hyperinsulinemia and insulin resistance are caused by obesity, or by excessive intake of carbohydrates, and specifically by sugar?"

Early in the book, Taubes rails against what he sees as "a century of ignorance" of the evidence implicating sugar, and the lack of rigorous use of the scientific method in medicine. (Recall Taubes' training in physics and engineering.) He's not alone, as Dr. John Ionnidis, professor of medicine and statistics at Stanford, describes in the essay "Why Most Published Research Findings Are False."[5] (Ionnidis also receives funding from John Arnold.)

Taubes lays out his thesis, much of which will be familiar to readers of his other works. He postulates that obesity is a hormonal disorder driven by hyperinsulinemia and caused by excess carbohydrate consumption. In his view, obesity is not caused by "calories in/calories out" or by "gluttony and sloth." He also discounts a multifactorial hypothesis, citing as an example tobacco as the primary cause of lung cancer, regardless of other associated factors.

Is sugar a drug?

Having identified the cause of obesity, Taubes asks, "Is sugar inherently a drug?" He cites animal studies that would indicate yes, while admitting

TRACY ZWEIG ASSOCIATES
INC.
A REGISTRY & PLACEMENT FIRM
Physicians
Nurse Practitioners ~ Physician Assistants

Locum Tenens ~ Permanent Placement
Voice: 800-919-9141 or 805-641-9141
FAX: 805-641-9143
tzweig@tracyzweig.com
www.tracyzweig.com

that these same studies would be impossible to perform in humans.

How did this "sugar drug" become so entrenched in modern society? Brought to the New World by Europeans and grown by slaves, sugar became an important commodity and source of taxation for the European empires. As Taubes explains, sugar stores and travels well, has no particular taste other than sweet, is useful in food preservation, fuels yeast used in baking, and decreases bitterness in food.

Sugar beet production provided much of the impetus for creating the U.S. Department of Agriculture in 1862. In 1876, sugar chemists founded the American Chemical Society. As Americans learned to grow and refine inexpensive sugar, entire industries developed to manufacture candy, chocolate, ice cream, soft drinks and highly refined white bread. The 1950s brought sugar-sweetened breakfast cereals, followed by cartoon characters—such as Tony the Tiger and the Flintstones—who were used to sell sugary products to children.

Taubes blames a trail of bad science for bringing us to where we are today. Dr. Elliott Joslin, whose 1916 *Treatment of Diabetes Mellitus* became the standard textbook in the field, stated that sugar was not the cause of diabetes. Taubes suggests that Joslin's understanding of biochemistry was poor and that he wrongly concluded that sugar was benign because he believed that all carbohydrates were essentially the same.

Dr. Harold Himsworth, another prominent physician at that time, also asserted that fat, not carbohydrates, caused diabetes, and he encouraged consumption of carbohydrates as a preventive measure. Taubes argues that Himsworth apparently ignored the "Black Swan" evidence that the Masai and the Inuit, who eat very high-fat diets, had negligible incidence of diabetes.

Vices make money

Alcohol, tobacco, illegal drugs and sex for hire are all vices that that many people find distasteful and unhealthy. What if, asks Taubes, sugar is in fact a vice that makes money, and not an integral part of our normal, healthy diet? During World War II, the federal government and the AMA supported a national policy of limiting sugar in the diet, partly because of wartime sugar rationing. Shortly after the end of the war, however, the sugar industry eagerly sought to increase its market by infiltrating academic institutions with money. Most notable was the industry's funding of the noted physiologist Ancel Keys, whose Seven Country Study was a primary factor in forming the belief that saturated fat, not sugar, causes heart disease.

For years, says Taubes, the sugar industry and its surrogates (e.g., Coca-Cola) argued that total calories are what causes obesity, and that dietary fat (not sugar) contributes to heart disease. The industry sought to weaken public perception of the direct relationship of sugar to dental caries, obesity and diabetes. Their efforts were so successful that researchers who suggested a link between sugar, diabetes and heart disease risked ruining their careers, even as use of sugar and high-fructose corn syrup increased nationwide. A recent historical analysis in *JAMA Internal Medicine* concluded that the sugar industry "sponsored a research program in the 1960s and 1970s that successfully cast doubt about the hazards of sucrose while promoting fat as the dietary culprit in CHD."[6]

The scientific method

Good science, Taubes reminds us, creates and tests hypotheses, insisting that we cast aside incorrect concepts and build on reliable, repeatable and irrefutable laws. Given the inherent challenges of nutrition science (such as looking for dietary triggers of disorders that develop over decades and the inherent dangers of various types of bias in epidemiological studies in nutrition) nutrition studies are expensive to perform and difficult or impossible to reproduce. Taube cites several NIH-funded studies (MRFIT, the Women's Health Initiative and LRC) designed to test the dietary-fat-cholesterol heart

(blood sugar)
Pass the test.

The Center for Well-Being is the source for premier diabetes education and support. Arm your patients with the tools they need to manage their Type II Diabetes. Services include:

- Diabetes Meal Planning
- Preventing Diabetes & Heart Disease
- Living Well with Type II Diabetes
- Medical Nutrition Therapy

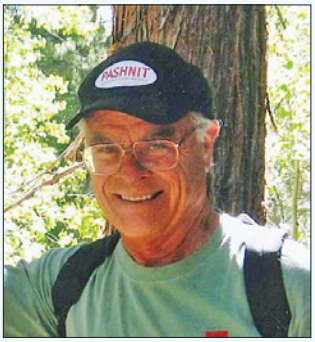
Classes covered by Medicare and most insurance providers.

CENTER FOR WELL-BEING

707.575.6043 | **NorCalWellBeing.org**
101 Brookwood Ave. • Santa Rosa, CA 95404

OBITUARY

Allan P. Fishbein



Allan P. Fishbein, MD, 78, of Reno, Nev., formerly of Santa Rosa, died on Sept. 21, 2016. He was a graduate of George Washington High School in San Francisco, class of 1956; UC Berkeley, class of 1960; and Washington University Medical School, St. Louis, class of 1964. Dr. Fishbein served two years as a major in the U.S. Army at Ft. Leonard Wood in Missouri.

Al did his residency at UCSF in radiology and practiced for 43 years with Redwood Radiology in Santa Rosa, retiring in December 2014. He was a member of SCMA and CMA for 44 years.

Al will be remembered for his curiosity and zest for life, which was contagious and inspirational. He was an avid sportsman, and flying was his special interest, both in single engine planes and gliders. His lifelong interest in education led to many travels and the hosting of foreign students. His sense of humor and enthusiasm delighted others.

He is survived by his wife of 53 years, Anne Bormann Fishbein; son Allan W. Fishbein of Santa Rosa, daughter Andrea Fishbein Cantin of Santa Rosa, and grandsons Ronan Fishbein and Alex, Liam and Maxim Cantin. A Celebration of Life is being planned for a future date.

disease hypothesis that failed to show much if any benefit on heart disease and mortality from lowering dietary cholesterol or restricting dietary fat.

Taubes invokes Isaac Newton's first rule of scientific reasoning, which states, "We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances." Taubes identifies sugar as the dominant aspect of "Western and urban lives" that explains the presence of chronic diseases. "The simplest hypothesis," he writes, "is always the most likely." He argues that sugar is the "primary cause of insulin resistance and metabolic syndrome, and therefore obesity, diabetes and heart disease." If insulin resistance and metabolic syndrome are caused by sugar, then all of these other diseases are caused by sugar as well.

Hypertension, cancer and dementia

Taubes further concludes that hypertension is caused by too much sugar, not too much salt, finding that the sodium/hypertension hypothesis is "another example of how perspective and the available technology drive scientific understanding." He notes that hypertension "emerged" in aboriginal populations at the same time as obesity and diabetes, and he presents evidence from systematic reviews that fail to confirm the sodium/hypertension hypothesis. He goes on to discuss research that found insulin to be anti-diuretic and therefore pro-hypertensive, as well as research findings that fructose causes renal glomerular damage and potentially the renal vascular damage associated with diabetes. He also notes that both type 2 diabetes and hypertension increase the risk for vascular dementia. The association with insulin resistance and Alzheimer's, according to Taubes, is so strong that "some researchers think of Alzheimer's as type 3 diabetes."

Turning to cancer, Taubes cites Albert Schweitzer's observations that when indigenous populations ate more like Westerners, cancer became more frequent; the increase in cancer among the Inuit; and the "critical observation that obesity and diabetes both associate with an increased risk of cancer." He goes on to describe Eugenia Calle's 2003 report associating cancer mortality with obesity; Howard Temin's work demonstrating that cultured cancer cells require insulin to survive; and Lewis Cantly and Craig Thompson's hypothesis that cancer is a metabolic disease, with excess insulin as a causative factor.

There are more than 500,000 peer-reviewed articles on obesity and diabetes without a coherent picture. Taubes boils it all down to sugar.

Just how much sugar do we eat? A surprising three-fourths of a cup of added sugar, per person, per day![7] As Paul Rudnick recently observed in the *New York Times*, the problem is that "sugar tastes really, really good."[8]

Then what is sugar good for? Ironically, it can be applied topically to heal diabetic foot ulcers.[9] ◇

Author email: schulman@schulmanmd.com
Letters to editor: osborn53@sonic.net

References

1. Younossi ZM, et al, "Economic and clinical burden of nonalcoholic fatty liver disease in the United States and Europe," *Hepatology,* 64:1577-86 (2016).
2. CDC, "Estimates of diabetes and its burden in the United States," *National Diabetes Statistics Report,* www.cdc.gov/diabetes (2014).
3. Stokes A, "Preston SH deaths attributable to diabetes in the United States," *PLOS ONE,* 12:e0170219 (2017).
4. Alzheimer's Association, "Alzheimer's disease facts and figures," *Alz Dement,* 12:459-509, (2016).
5. Ionnadis JP, "Why most published research findings are false," *PLOS Med,* 0020124 (Aug. 30, 2005).
6. Kearns CE, et al, "Sugar industry and coronary heart disease research," *JAMA Intern Med,* 176:1680-85 (2016).
7. Ferdman RA, "Where people around the world eat the most sugar and fat," *Washington Post,* (Feb. 5, 2015).
8. Rudnick P, "The case for sugar," *New York Times* (Feb. 4, 2017).
9. Biswas A, et al, "Use of sugar on the healing of diabetic ulcers," *J Diabetes Sci Tech,* 4:1139-45 (2010).

Hey, Let's Give Back

Tom Honrath, MD

Throughout my medical career, I have witnessed how generous Sonoma County physicians have been in donating their time and talent to poor and uninsured patients. Many local physicians have gone on medical missions all around the world. Other physicians may have aspired to do the same, but they don't have the time or finances to do so. Fortunately, there are many opportunities right here in Sonoma County that require no time away from your family and cost nothing.

If all of our physicians and nurse practitioners could give an hour or two a month, just think of what we could accomplish by serving the poor and homeless with their medical needs. We could even be a model for the rest of California.

As I approach the last years of my medical career, I think about "easing" into retirement by doing volunteer work at one or more of the many free clinics in our area. They all need volunteer primary care physicians and nurse practitioners, and specialists can volunteer to see one or more patients a month in their office. The sidebar shows a selected list; there may be other opportunities.

I would check with your malpractice insurance carrier first to be sure you are covered. For physicians and NPs, malpractice insurance should cover us for doing volunteer work that is within the scope of our practice. Retired physicians can check with the underwriting department at their previous insurance company about tail coverage for volunteering. Many organizations provide malpractice coverage for volunteering.

So, take up the challenge, check out these opportunities, and see what a difference you can make! ◇

Dr. Honrath is a Santa Rosa family physician.
Email: HonratT@sutterhealth.org

- **Catholic Charities of Santa Rosa**
  Contact Noreen Mendoza at 707-528-8712. Multiple opportunities may be available.
- **Jewish Community Free Clinic**
  Visit jewishfreeclinic.org/volunteer or contact Dr. Deborah A. Roberts at robertde@sonoma.edu.
- **St. Joseph Mobile Health Clinic**
  Specialists can volunteer to see one or more patients per month. Contact Jackie Williams at 707-547-4612.
- **Sonoma County Medical Reserve**
  Sign up for disaster response efforts. Contact Claire Etienne at 707-565-4483 or Greg Mortensen at 707-565-4402.
- **True North Health Center**
  Help teach patients about lifestyle changes. Contact Dr. Alan Goldhamer at 707-586-5555.
- **Volunteer Center of Sonoma County**
  Contact Priscilla Essert at 707-890-8909.

WESTERN
Health Care
LEADERSHIP ACADEMY
MARRIOTT MARQUIS SAN DIEGO MARINA • MAY 5 – 7, 2017 • SAN DIEGO, CA
With featured speaker
Abraham Verghese, M.D., MACP,
renowned surgeon and
New York Times bestselling
author of Cutting for Stone.
Paul Begala
Hugh Hewitt
Wendy Sue Swanson, MD
Ira Flatow
With a dramatic shake-up happening in Washington, D.C.,
the Western Health Care Leadership Academy's the right place and time for leaders who want to stay on top of policy changes to shape the future of health care.
REGISTER ONLINE:
www.WesternLeadershipAcademy.com
NATIONAL PRESENTING SPONSOR
THE PHYSICIANS FOUNDATION
THIS ACTIVITY HAS BEEN APPROVED FOR AMA PRA CATEGORY 1 CREDITS™

MEMBERSHIP HAS ITS BENEFITS!

Free and discounted programs for SCMA/CMA members

BENEFIT	PROVIDER
Auto/Homeowners Insurance *Save up to 8% on insurance services*	**Mercury Insurance Group** 888-637-2431 • www.mercuryinsurance.com/cma
Car Rental *Save up to 25%*	**Avis or Hertz** 800-786-4262 • www.cmanet.org/groupdiscounts
CME Certification Services *Discounted CME certification for members*	**CMA's Institute for Medical Quality** 415-882-5151 / www.imq.org
HIPAA Compliance Toolkit *Various discounts*	**PrivaPlan Associates, Inc.** 877-218-7707 • www.privaplan.com
ICD-10-CM Training *Deeply discounted rates on several ICD-10 solutions, including ICD-10 Code Set Boot Camps*	**AAPC** www.cmanet.org/aapc
Insurance Services *Save up to 25% on workers' comp insurance and receive special pricing and/or enhanced coverage for life, disability, long term care, medical, dental and more*	**Mercer Health & Benefits Insurance Services LLC** 800-842-3761 cmacounty.insurance.service@mercer.com www.CountyCMAMemberInsurance.com
Legal Services *FREE access to CMA On-Call (online health law library), access to CMA legal staff through the legal information line and more*	**CMA's Center for Legal Affairs** 800-786-4262 • legalinfo@cmanet.org www.cmanet.org/legal
Magazine Subscriptions *Save up to 50% on all subscriptions*	**Subscription Services, Inc.** 800-289-6247 • www.cmanet.org/magazines
Medical IDs *Discounts on 24-hour emergency identification and family notification services*	**MedicAlert** 800-253-7880 • www.cmanet.org/medicalert
Medical Waste Management *Save 30% or more on medical waste management and regulatory compliance services and 50% on the Compliance Portal*	**EnviroMerica** 650-655-2045 • www.cmanet.org/enviromerica
Mobile Physician Websites *Save up to $1,000 on unique website packages*	**MAYACO Marketing & Internet** 209-957-8629 • www.cmanet.org/mayaco
Office supplies, facility, technology, furniture, custom printing and more . . . *Save up to 80%*	**Staples Advantage** 800-786-4262 • www.cmanet.org/staples
Physician Laboratory Accreditation *15% off lab accreditation programs and services*	**COLA** 800-786-4262 • www.cmanet.org/cola
Physician Smartphone App *FREE secure messaging application*	**DocbookMD** www.cmanet.org/docbookmd
Reimbursement Assistance *FREE assistance with reimbursement and contracting issues*	**CMA's Center for Economic Services** 800-401-5911 • economicservices@cmanet.org www.cmanet.org/ces
Security Prescription Products *15% off tamper-resistant security subscription pads*	**RxSecurity** 800-667-9723 • www.cmanet.org/rxsecurity
Webinars and Seminars *CMA works with industry experts to offer timely, high-quality education programs, including FREE webinars and deep discounts on live seminars*	**CMA** www.cmanet.org/events

PUBLICATIONS

CMA Publications

www.cmanet.org/news-and-events/publications/

- ***CMA Alert*** **e-newsletter**
- ***CMA Practice Resources***

CMA Resource Library & Store

www.cmanet.org/resource-library/list?category=publications

- Advance Health Care Directive Kit
- California Physician's Legal Handbook
- Closing a Medical Practice
- Do Not Resuscitate Form
- HIPAA Compliance Online Toolkit
- Managed Care Contracting Toolkit
- Model Medical Staff Bylaws
- Patient-Physician Arbitration Agreements
- Physicians Orders for Life Sustaining Treatment Kit

SCMA Publications

www.scma.org

- ***Sonoma Medicine*** (quarterly)
- ***Sonoma County Physician Directory*** (annual)
- ***SCMA News Briefs*** (monthly)

CONTACT SCMA/CMA: 707-525-4375 • scma@scma.org

NEW MEMBERS

Aesthetic Laser & Vein Centers

Walter Tom, MD, Surgery*, 70 Stony Pt. Rd. #G, Santa Rosa, Wayne State Univ 1980

Eye Care Institute

Kalene Wong, MD, Ophthalmology*, 1017 Second St., Santa Rosa, UC Davis 1986

Family Care Allergy & Asthma

Jewmaull J. Reed, MD, Allergy & Immunology*, 130 Stony Point Rd. #E, Santa Rosa, Univ Illinois 2009

Hospice by the Bay

Corby Kessler, MD, Physical Medicine & Rehabilitation*, 190 W. Napa St., Sonoma, Univ Illinois 1988

North Bay Eye Associates Medical Group

Michael Saidel, MD, Ophthalmology, 50 Professional Center Dr. #210, Rohnert Park, Univ Illinois 1999

St. Joseph Health Medical Group

Mary Berg, MD, Family Medicine, 510 Doyle Park Dr., Santa Rosa, Howard Univ 1986

Kurtis Birch, MD, Neurological Surgery, 525 Doyle Park Dr. #105, Santa Rosa, Boston Univ 2010

Elliott Brandwene, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, UC San Diego 1994

Dale Britt, MD, Emergency Medicine, 925 Corporate Center Pkwy. #A, Santa Rosa, Baylor Coll Med 1980

Deborah Colina, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, UC San Francisco 2005

Stephen DeNigris, MD, Gastroenterology, 1383 N. McDowell Blvd. #110A, Petaluma, Georgetown Univ 1988

James Doll, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Wright State Univ 1994

Omar Ferrari, DO, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Touro Univ 2009

Gerrard Ferrer, DO, Neurology, 1194 Montgomery Dr., Santa Rosa, New York Coll Osteo Med 1995

Khuyshdeep Grewal, MD, Internal Medicine, 1165 Montgomery Dr., Santa Rosa, Ross Univ 2010

Winthrop Hedrick, DO, Emergency Medicine, 925 Corporate Center Pkwy. #A, Santa Rosa, Chicago Coll Osteo Med 1995

Adam Kaplan, MD, Urology, 1701 Fourth St., Santa Rosa, UC Irvine 2008

Jonathan Kurss, MD, Obstetrics & Gynecology, 500 Doyle Park Dr. #200, Santa Rosa, Univ Caribbean 2012

Daniel Laird, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Univ Southern California 2012

Stewart Lauterbach, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Univ Cincinnati 1981

Charles Magee, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Univ Mississippi 1978

Jennifer McCall, DO, Pediatrics, 500 Doyle Park Dr. #100, Santa Rosa, Touro Univ

Glenn Meade, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Univ Chicago 1976

Mark Shapiro, MD, Internal Medicine*, 1165 Montgomery Dr., Santa Rosa, Baylor Coll Med 2003

Austin Sue, MD, Hospice & Palliative Medicine, 1165 Montgomery Dr., Santa Rosa, Ross Univ 2012

Matthew Thomas, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Univ Caribbean 2012

Janet Uhde, MD, Emergency Medicine, 1165 Montgomery Dr., Santa Rosa, Albany Med Coll 2004

Keri Weigle, MD, Surgery, 106 Lynch Creek Way #9B, Petaluma, Univ Maryland 2009

Edward West, MD, Emergency Medicine, 925 Corporate Center Pkwy. #A, Santa Rosa, Univ Tennessee 1973

* board certified

CLASSIFIED

Primary Care Physician
Sonoma State University
Student Health Center

Excellent opportunity for CA licensed physician, BE/BC in a primary care specialty to join a collegial team providing quality, evidence-based, ambulatory care in the nationally accredited SSU Student Health Center, www.sonoma.edu/shc/. Ten mo/yr weekday schedule; secure salaried income; excellent benefits. For details & to apply go to www.sonoma.edu/jobs/. Job ID: 104310.

SUPPORT
Our Advertisers . . .

Asian & Pacific Islander Health Forum . . . 20
Audiology Associates . . . 30
Bank of America . . . 8
Bear Flag Insurance . . . 6
Cal Coast Credit Service . . . 18
California Sinus Center . . . 5
Center for Well-Being . . . 35
Classified ads . . . 39
CMA Leadership Academy . . . 37
Institute for Health Management . . . 30
Institute for Medical Quality . . . 15
Marin Weight Loss & Wellness . . . 32
NORCAL Mutual Insurance Company . . . 16
Practice Managers Forum . . . 43
SCMA Membership . . . 4
SCMA Wine & Cheese Reception . . . 22
SCMA/CMA Benefits . . . 38
SCMAAF Garden Tour . . . 42
Sonoma County Indian Health Project . . . 21
St. Joseph Health . . . Inside back cover
St. Joseph Health Medical Group . . . 3, 18
Sutter Health . . . Back cover
Sutter Medical Group of the Redwoods . . . 12
The Doctors Company . . . Inside front cover
Tracy Zweig Associates . . . 34

THEY SUPPORT THE MAGAZINE!

Transforming Backyards into Gardens

Patty Lyn Tweten, Melissa Kelly, David Fowler

At its heart, the Sonoma County Medical Association Alliance Foundation is a group of physician families—your families. Our 25th Anniversary Garden Tour benefit is approaching in late May, and two physician families are preparing to lend their gardens and their support to this fundraising event. Dr. Stephen Meffert and his wife, Melissa Kelly, are hosting a kickoff reception in April for garden owners, SCMAAF members, sponsors and beneficiaries. After the Garden Tour ends in May, an appreciation reception for tour volunteers and garden owners will be held at the home and garden of Mike and Alison Vallenari. Their landscape architect, David Fowler, is married to Dr. Hana Clark.

Melissa Kelly and Dr. Stephen Meffert enjoying the wabi-sabi of their landscape.

As physician spouses, Melissa and David have experienced the challenges of moving and changing to meet the needs of their partners' evolving medical careers. They both made a home for themselves in Sonoma County, and they both found a way to enrich the lives of their families through creating beautiful outdoor spaces. They share their stories here. Melissa tells her story in third person; David in first.

Finding Beauty in Imperfection

As the torrential rains continued day after day, Steve and Melissa towed their young daughter from one open house to another in search of their new Santa Rosa home. While it might sound like 2017, the year was actually 1998, and Northern California was in the grip of El Niño.

Steve and Melissa were on a three-day visit from New Orleans, where Steve was finishing his retinal fellowship. After returning to New Orleans, they kept replaying the one house that appealed to both of them. Its key feature? Proximity to Spring Lake Regional Park and Annadel State Park.

When they secured the house and moved in that summer, it featured a yard that was beautiful but not at all to their taste. Large lawns spread out from both the front and back of the house. Rhododendrons, hydrangeas, gardenias and other thirsty ornamental flowers were in abundance. The back of the house featured a bulky wooden deck and what the children called "the bird cage"—a 20-foot by 20-foot garden patch completely enclosed with chicken wire.

With two working parents and small children at home, there was little extra time, so the existing lawn and garden stayed in place for quite a few years. But as calls for water conservation became more frequent, Melissa felt strongly that the existing lawn and flowers should be replaced with native and low-water

Ms. Tweten is vice president for marketing and communications for the SCMAAF; Melissa Kelley is the executive director of the Sonoma County Regional Parks Foundation; David Fowler is a landscape architect and sculptor.

The Vallenaris' hillside patio.

plants. She also wanted a yard that would support bees, butterflies, birds and other wildlife. Stumbling upon a website for stonemason and sculptor Edwin Hamilton, Melissa knew she had found the designer she was seeking for her home.

Edwin's studio is based in Penngrove, and he has produced stonework and sculpture for Strybing Arboretum in San Francisco, the San Francisco Botanical Garden, Huntington Botanical Gardens and more. His work takes him all over the United States; but as luck would have it, when Melissa contacted him in 2011, his wife Tammara Norman was expecting their first child, and Edwin was looking for projects closer to home.

Also as luck would have it, Tammara is a talented landscape architect. Melissa's backyard became Edwin and Tammara's first joint project.

The renovated space incorporates beautiful flagstones and other hardscape to reduce water use. Thirsty ornamentals have been replaced by manzanita, yarrow, native grasses, madrone and other low-water plants. A short pathway meanders through the property and into the "orchard," a small collection of fruit trees and one of the few features retained from the original landscaping.

Edwin and Tammara also taught their clients about the Japanese concept of wabi-sabi: the art of finding beauty in imperfection. Stones in the yard grow lichen and moss; outdoor wood furniture ages naturally over time. These changes are embraced as part of the natural evolution of the yard.

The yard is now Melissa and Steve's favorite part of their home. "We really succeeded in bringing some of the park sensibilities that we love right to our backyard," says Melissa. "Steve has taken up bee keeping, and the bees thrive with all the native plants we've installed. Edwin and Tammara did a spectacular job in creating this little piece of paradise, and we look forward to sharing it with the Garden Tour this year."

Edwin Hamilton and Tammara Norman maintain a studio in Penngrove. Examples of Edwin and Tammara's work can be seen at www.hamiltonstoneworks.com.

From Ironman to Steel Sculptor

I discovered landscape architecture while living in Berkeley and training for the Ironman Triathlon World Championship. One of the members of my running group was a landscape architect. During a long run he told me about his career and the work that went along with it. I was in my early twenties and still had no idea what I wanted to do. I was working at Peet's Coffee and the YMCA to support my triathlon addiction, so the landscape architect's job seemed like a dream come true. He got to design landscapes, visit construction sites, meet new people and, most importantly, be his own boss. That week, I began my journey toward becoming a landscape architect, and I have never regretted it.

Within a couple of years of that fateful run, my wife (Dr. Hana Clark) and I moved to Phoenix, where we both completed our graduate studies. After she graduated from medical school and I finished my landscape architecture degree, we moved to Santa Rosa for her residency. Hana quickly dove into the rigorous schedule and lifestyle of

residency, and I spent the first year of our time here taking care of our one-year-old son, Lucas. I would take Lucas out for long runs in the jogging stroller, but medical school, residency and the arrival of a new family member had diminished my passion for racing in triathlons. My new passion to design landscapes had blossomed in Arizona, and after a couple of years working for a local landscape architect, I was ready to get licensed and strike out on my own.

Soon afterward, I was introduced to Mike and Alison Vallenari. They became my clients for a landscape architect's dream project. Their backyard in Fountaingrove had a beautiful view of the city, but it was on a fairly steep slope. Other than a small paver patio, there was almost no usable outdoor space. During our initial meeting, they said they wanted a swimming pool, a spa, a large covered outdoor kitchen, a pizza oven, a fire pit, a running stream, a vegetable garden, and a spacious lawn and play area for their grandchildren. It took some time to design their perfect landscape, but I think we were able to achieve or even exceed all their goals and expectations with the final product.

With all my projects, I try to create spaces that bring people outside. We live in one of the most beautiful areas in the country, and we should take advantage of the great weather and beautiful surroundings we have. Whether people like to garden, host dinner parties or just play in the yard with their children, it is generally possible to transform a backyard into something that fits your needs.

In addition to landscape architecture, I discovered metal sculpture in graduate school. I had always loved art and working with my hands, but I figured most of my work would be done with a pencil and a computer. Sculpture, however, allowed me to use a welder and a plasma cutter to turn my ideas into forms that I could place in the landscape to complement my designs. Welding and grinding steel became my new form of meditation.

The most important part of my journey in landscape architecture and sculpture has been my wife. Our careers and personalities balance out well and keep our lives in check. Her schedule is planned about a year and a half in advance, but I plan most of my days when I wake up in the morning. Our work and schedules are very different, yet we manage to get the kids to school on time and have dinner on the table at the end of day. ◇

David has donated a sculpture to the Garden Tour raffle. His work can be viewed at www.davidfowlerdesigns.com.

Garden Tour raffle items can be seen at www.scmaa.org. Tickets and sponsorship opportunities are available at www.scmaa.org. If you want to volunteer for the Garden Tour or get further information, contact the Garden Tour chair, Barbara Ramsey, at 707-535-0747.

The Sonoma County Medical Association Alliance Foundation presents:
25th
SCMAAF GARDEN TOUR 2017
The 25th Anniverary Garden Tour
Gardens Enrich Lives!
MAY 19&20 2017
Featuring 7 Santa Rosa Gardens Plus BONUS Sponsorship Garden •
Luxury Raffle Items • Art Sale, Book Sale and Plant Sale •
Food Truck Lunch •
Proceeds benefit Sonoma County nonprofit health care organizations
SCMAAF
1929
Tickets on sale now!
Details & Tickets at www.scmaa.org

SONOMA COUNTY MEDICAL ASSOCIATION

S·C·M·A

Practice Managers Forum

A LOCAL NETWORK FOR SCMA/CMA MEMBERS AND THEIR STAFF

Lunch & Learn Seminar

MEDICARE CHANGES

2017 and Beyond

Wednesday, May 17, 2017 ■ **11:30 a.m. – 1:00 p.m.**

Partnership HealthPlan
495 Tesconi Circle, Santa Rosa

■ **$20 registration fee includes lunch**
Bring a friend(s) for just $10 each

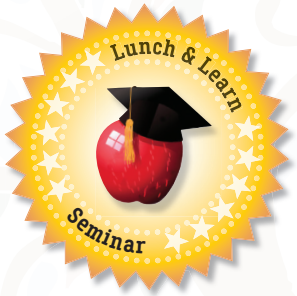
Presenter **Cheryl Bradley,** Associate Director in the **CMA's Center for Economic Services**, provides one-on-one support to CMA member physicians on Medicare issues. Cheryl has over 20 years experience in the Medicare Program, having worked as an Education and Training Specialist, Medical Review Analyst, and as a Customer Service Representative across all of the CA Medicare contractors, including Noridian Healthcare solutions most recently. Cheryl has provided problem solving assistance and has presented to physicians, specialty organizations, billing staff, and other health care professionals in California, Hawaii and Nevada.

CMA California Medical Association

Cheryl's presentation will cover:

- **Changes to the Medicare program in the upcoming year, including MACRA, the 2017 Medicare Physician Fee Schedule, annual updates and other changes.**
- **Review of existing programs, such as PQRS and the Value Based Modifier, that may negatively impact payments through 2018, as well as provide tips on how to navigate and prepare for MACRA implementation, which begins in 2017.**

RETURN REGISTRATION BY • **Fax:** 707-525-4328 • **Email:** rachel@scma.org
• **Mail:** SCMA, 2312 Bethards Dr. #6, Santa Rosa 95405



Name _____ Phone _____

Email _____ Fax _____

Friend's name _____ Phone _____

Friend's email _____

☐ Physician ☐ Office Manager ☐ Other _____

Check payment option: ☐ Check enclosed

☐ VISA/MasterCard # _____ Exp. Date _____ Charge amount _____

■ Questions? Contact Rachel Pandolfi at 707-525-4375 or rachel@scma.org ■

The quarterly **Practice Managers Forum** **Lunch & Learn** seminars offer attendees a broad array of topics related to medical staff services, office management, billing and coding, human resources, accounting and back office support. *Nonmembers, and/or their staff, are welcome to attend.*

Change

Regina Sullivan, MD

Have you noticed a change in the weather? I listen to my son and daughter debate their future plans and hear how stressed out they are from contemplating the many changes that will occur in their young lives next year. My son is weighing all the pros and cons of graduate school programs, deciding whether to plunge right in or to defer a year and travel. My daughter will soon wave goodbye to high school and choose and enter a college. Her familiar, trusted counselor that she's had since freshman year will be retiring and not be there during her senior year. Change.

I counsel them that change is an integral part of life and will always be on the doorstep to the future. It is how we anticipate and react to change that makes all the difference in how we grow and how we live rewarding, contented lives. It struck me that what my children are going through is a microcosm of what is happening all around us. There is change in the leadership of this country and change in our laws. There is even change at the Sonoma County Medical Association. After almost a decade of affiliation with Marin and Mendocino-Lake medical societies, SCMA is once again a stand-alone, single-county medical society. SCMA's longtime executive director, Cynthia Melody, has retired, and Wendy Young has joined our staff as the new executive director. Change.

Amid all these changes, there are rumors and speculations and crystal-ball gazing everywhere as to what the future holds. Both positive and negative outlooks cloud the view of what is to come. Good or bad is the interpretive label we place on our individual situation. Do you see opportunities and strive to adapt, accept and become better, or do you lament the old ways and resist the coming change?

Change is part of life and growth. Medicine has always been dynamic, never stagnant. One can argue that change in medical care is inherent in becoming better and more efficient. Evidence-based care, electronic medical records, provider teams, robotics and medical homes are just a few examples of enormous changes in medical care. We've come a long way. There's little resemblance in the way medicine was practiced 50 years ago to what our practice has become today. Change.

How successfully we manage change depends on our response and resilience. In a previous article here in *Sonoma Medicine,* Dr. Rob Nied wrote in depth about our collective resilience. I strongly believe that we in the medical profession are resilient. SCMA has faced challenges in the past and has stepped up to adapt and become a stronger and more cohesive group. As we face the future with our new executive director and our stand-alone county medical society, we can move from a fearful overwhelmed sensation to one of being empowered by change, reaching down inside ourselves and tapping into our collective resilience. Welcome to spring. ◇

Dr. Sullivan, an ob-gyn at Kaiser Permanente Santa Rosa, is president of SCMA.

Author email: regina.t.sullivan@kp.org

SCMA Welcomes Wendy Young as Executive Director

Wendy Young, SCMA'S new executive director, brings more than a decade of nonprofit management experience to the position. For the past 10 years, she was executive director of the Redwood Empire Chapter of the American Institute of Architects, overseeing a thriving chapter of the national AIA organization. Her experience in association management includes board development, leading committees and volunteers, creating networking opportunities, and planning member events.

Wendy understands the value in creating an engaging professional membership organization and identifying future leaders to guide SCMA into the next generation. She brings a great deal of energy and expertise to the position and is looking forward to meeting and working with SCMA members to ensure a successful transition and a fresh vision for the future of SCMA.

As a member of the Santa Rosa Chamber of Commerce Advocacy Council, Wendy will keep an eye on local issues pertaining to medicine. She will also work with government, business groups and community leaders to ensure physicians' voices are heard during policy development and implementation.

Wendy, born in Memphis, Tenn., graduated from Sonoma State University and worked in the legal field for 17 years before embarking on a career in association management—a natural transition for her outgoing leadership style and personality. She moved to Sonoma County from San Francisco in 1989 and now lives in Windsor with her two children: Aly, 18, and Nicholas, 19.

Please join your colleagues in welcoming Wendy to SCMA. "I am eager to hear from you," she said, "to discuss your vision for the future of SCMA as we strive to serve the local medical community." Wendy can be reached at 707-525-4375 or exec@scma.org. ◇

Expect more when you choose St. Joseph Health Medical Group

St. Joseph Health Medical Group is a fast-growing team of highly trained practitioners in both primary and specialty care. Our services include a full spectrum of primary care including pediatrics, family medicine, internal medicine, oncology, medical and surgical specialty care as well as hospital-based medicine.

We believe in taking the time to know our patients, answer their questions, and explain their diagnoses and treatment options. Our patients receive top-notch care and we pride ourselves on our collegiality, collaboration, and excellent patient satisfaction scores.

- Cancer Care
- Clinical Trials
- Emergency Services
- Heart Care
- Home Care
- Hospice
- Hospitalists
- Injury Prevention
- Mental Health
- Newborns/Infants
- Orthopedics
- Outpatient Services
- Palliative Care
- Pediatrics
- Pregnancy
- Rehabilitation
- Spine Care
- Stroke Care
- Trauma Care
- Urgent Care
- Vascular Services
- Women's Health

To learn more about our medical group or the services we offer, visit **StJosephHealthMedicalGroup.com** or call **(707) 266-2335**.

Offices located in Healdsburg, Lakeport, Napa, Novato, Petaluma, Santa Rosa, Sebastopol & Ukiah.

St. Joseph Health℠
Medical Group

Finding the right surgeon shouldn't be a pain.

Our specialists use the region's only robotic-assisted technologies, such as the daVinci Xi® and MAKO® surgical systems, for your optimal recovery. Minimally invasive surgery often results in fewer complications, smaller scars and less pain.

Proudly caring for Northern California. Birthplace of pioneers.

Sutter Health
Sutter Pacific
Medical Foundation

Find the right surgeon at
sutterpacific.org/surgery